UNIVERSITY OF ALBERTA LIBRARY
0 1620 0453 3517

LONGMANS COLOUR GEOGRAPHIES

UNIT 15

West Indies and Gulf Coasts

G
73
H54
UNIT
15
CURR

DISCARD
DISCARD

LO HIES

Ex libris
Universitatis
Albertaensis

QUAECUMQUE VERA

West Inc
How Sug
Sugar an
The Sugar Plantation To-day
Bananas
Growing Cotton

tion
Factory
an Lands
Finding and Extracting Oil
Oil Well to User
Things to Remember

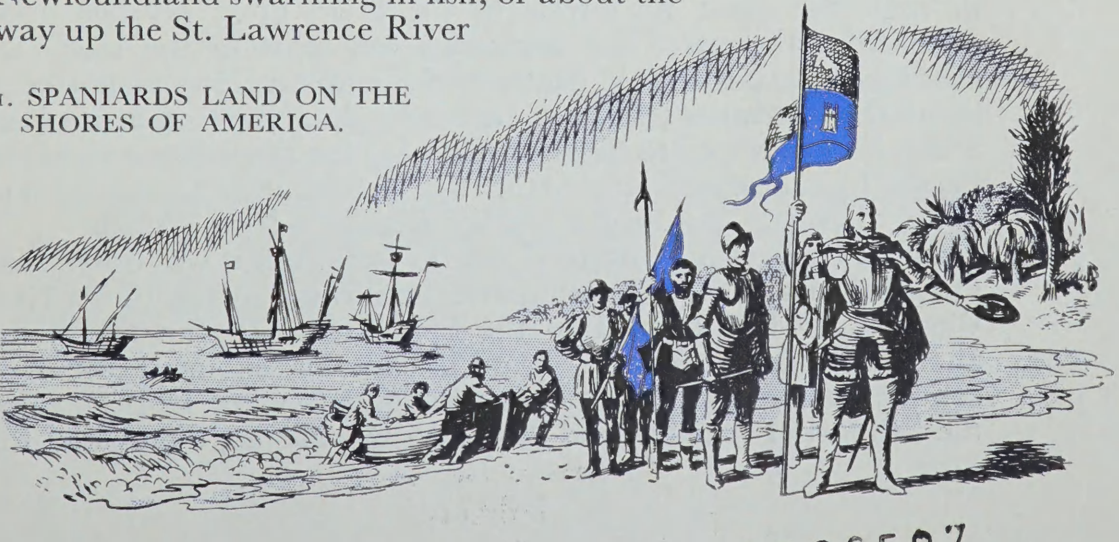
LONGMANS

LIBRARY
UNIVERSITY OF ALBERTA

WEST INDIES AND GULF COASTS

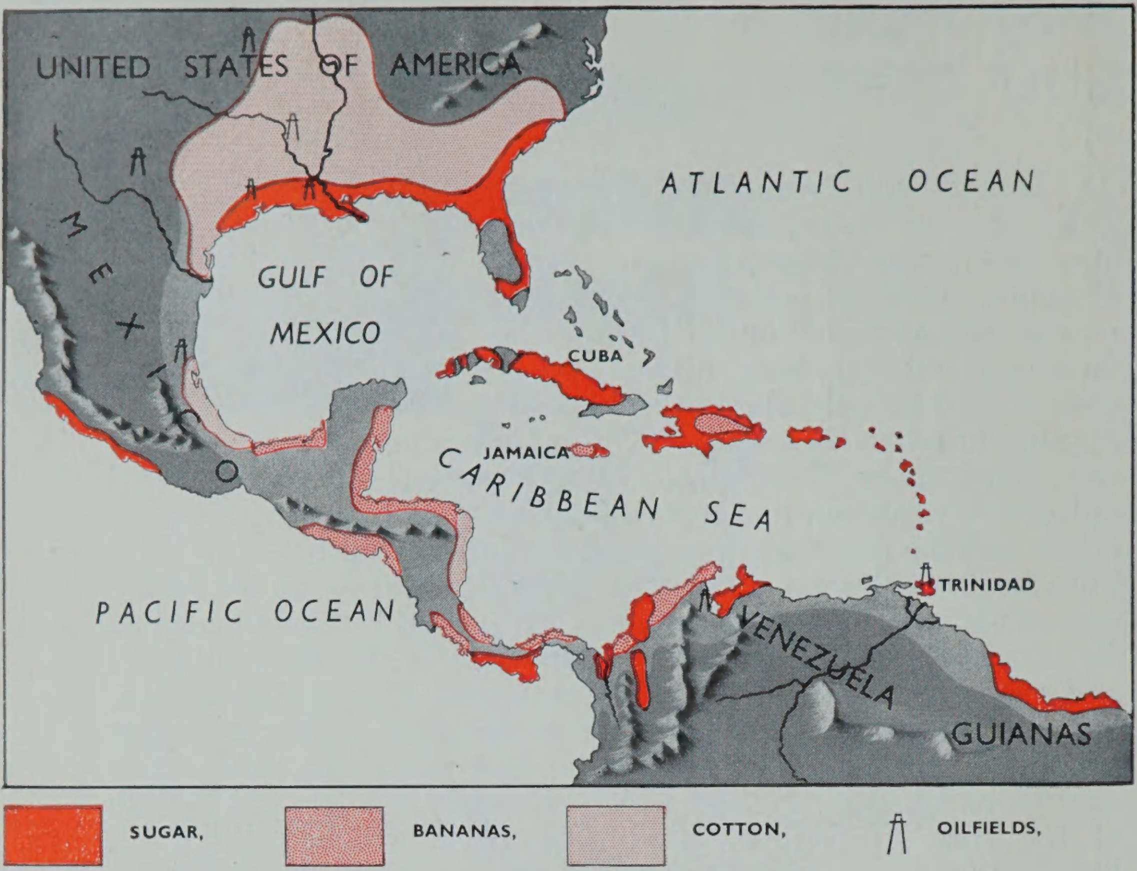
ABOUT 500 years ago Europeans began to make, for the first time, long and daring voyages by sea. Instead of sailing along the coasts of the Mediterranean Sea and of Western Europe, captains set out on long ocean voyages, leaving land far behind them and knowing nothing of what lay ahead. The most daring of these captains was Christopher Columbus. Many captains before him had sailed westwards but had turned back terrified by the wide empty ocean and the fear that they might never find winds to blow their ships back to Europe. But Columbus planned to go on sailing westwards until he did find land. He was sure that if he sailed far enough he would sooner or later come to the East, to India and the East Indies and the China which Marco Polo visited. Thus he would find a new route to the East. This sea route would be safe from the Turks who had made the land routes dangerous for the caravans which so slowly brought the wealth of the East to Europe. Columbus never reached the East, but, in 1492, after sailing westwards for five weeks, he did find a new West. America had been discovered.

Columbus never knew anything about the cold, bleak shores of Newfoundland swarming in fish, or about the way up the St. Lawrence River



1. SPANIARDS LAND ON THE SHORES OF AMERICA.

2568507



2. THE WEST INDIAN AND GULF REGION AND ITS MAJOR PRODUCTS.

through the great fir forests to the huge grass prairies 1000 miles from the sea. He never saw any part of the lands we now know as the United States and Canada. He did not even know that between the West Indies he discovered and the East Indies he had hoped to discover there lay the huge distances of the Pacific Ocean, much larger still than the Atlantic Ocean he had dared to cross. But he did find for Europe a New World.

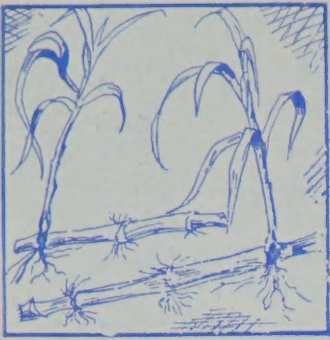
Columbus was a native of Genoa in Italy, but it was Spain that provided him with ships and crews, and so the secrets of the New World were first opened to the Spaniards. In the fifty years after Columbus's voyage, Spanish captains explored the new continents from Florida and Mexico down to Cape Horn, crossed the isthmus of Panama and gazed on the Pacific, discovered the stormy straits of Magellan and sailed on the Pacific Ocean up the coasts of Chile and Peru and beyond, as far north as San Francisco. From these long-ago happenings it has come about that the language of nearly all America south of the United States is Spanish to this day. The only exceptions are Brazil, which the Portuguese first made their own, the Guianas, and those West Indian islands taken from the Spaniards by the French and the Dutch and the English, who were not prepared to allow the Spaniards to keep *all* these lands their own.

Many of the Spaniards who came after Columbus did not care whether they had found West Indies or East Indies. On the mainland they found gold mines and silver mines and were very well content to sail back to Europe with their ships loaded with treasure. On their trail came sailors of many nations who hoped to get rich quickly by robbing the treasure ships. For many years the Spanish Main and the Caribbean Sea were the scene of frequent looting and pillaging of towns and of piracy on the high seas. Nobody cared about the native peoples who lived there when the Europeans came. Ill-treated by the conquerors, they mostly fled to the hills and the forests.

But some of the explorers were most impressed with the speed with which tropical plants grew in the hot sun and plentiful rain of the Caribbean lands. They found that here they could grow many things which could not be grown in colder Europe. So they brought seeds and plants from Asia and Africa and grew new crops in these lands.

John and Sebastian Cabot, Magellan and Vasco da Gama all made long ocean voyages soon after Columbus had reached the West Indies. To what lands did each of them go? Trace a map of the world and shade or colour the new lands they made known.

It was known that the Spice Islands the explorers sought to reach lay far away to the *east* of Europe. Why then did Columbus and many others sail *west* to try and find them? What must they have believed about the shape of the earth?



HOW SUGAR CAME TO THE WEST

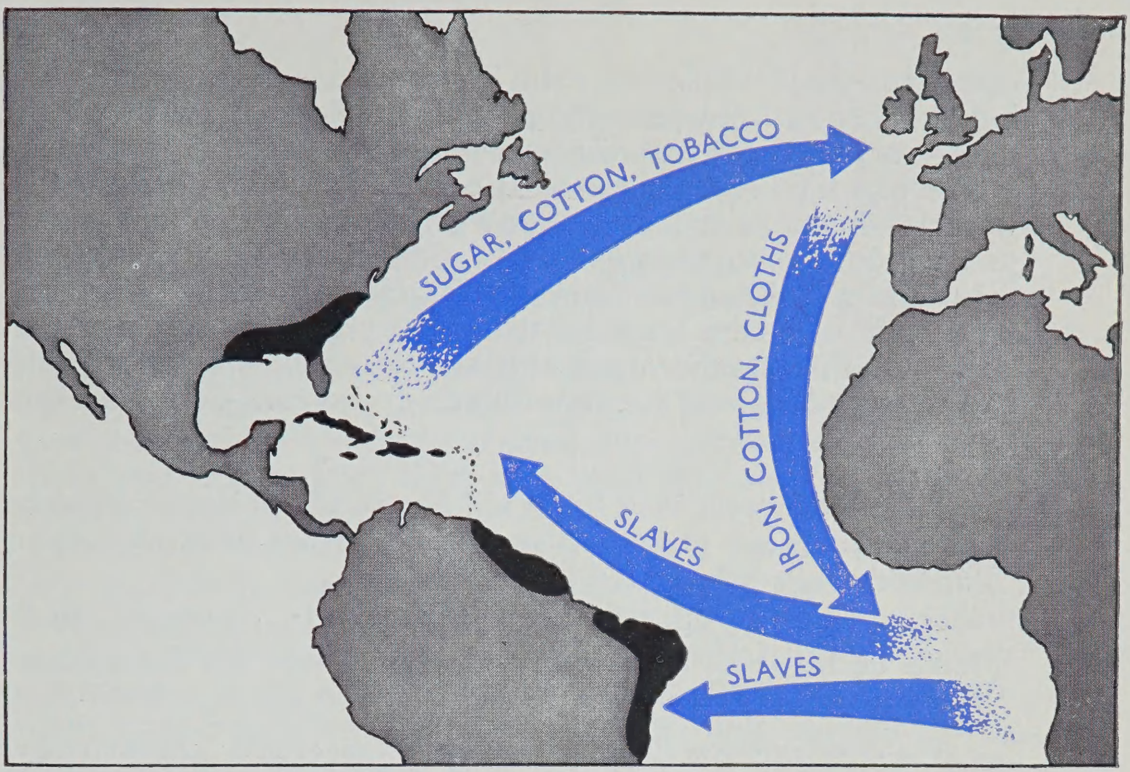
HOW much sugar do you eat in a year? You must include all the sugar used in cooking and in the cakes and chocolates and sweets and ices you buy.

It is difficult for us to-day to think that in the days of Columbus common people in all Western Europe never tasted sugar. A very little was brought from India and was a very dear luxury, even as late as the reign of Queen Elizabeth I.

The Portuguese were the first people to bring larger quantities of sugar to Europe. They started to grow sugar-cane in the coastlands of Brazil—hot, rainy lands covered with jungle. They brought the first sugar-canes from India, and found that this climate suited the plant very well. Soon there were some sugar plantations all along the coast.

The Portuguese, however, could not find enough men to work on these plantations. A great deal of very heavy work was needed to clear the ground of the jungle, to plant the canes and keep the land free from weeds, to cut the canes and carry them to the sugar-mill where the juice was crushed out of the canes. Europeans could not stand such heavy work in the hot, damp climate, and the natives were not very good at the job or very willing. So the sugar planters decided to bring to the country strong, able-bodied Africans from the West Coast of Africa. This was the beginning of the slave trade and the beginning of a period of great prosperity for the European planter. The African slaves cleared great stretches of the jungle and planted sugar-cane. The ships that brought the slaves from Africa took the raw sugar to Europe, where they could sell as much as they brought. And from Europe they could sail back to West Africa with iron bars, brass goods, and trinkets with which to buy more slaves. The slave traders and the plantation owners grew wealthy.

Soon men of other countries sought a share in this new way of becoming rich. The Dutch started plantations in Guiana, and the French and British settlers planted cane in the islands they ruled. It was not long before the West Indies could produce all the sugar the world needed.



3. THE TRIANGULAR TRADE. In the 17th and 18th centuries trading ships had full cargoes for each leg of the round voyage—partly manufactured goods to Africa; slaves to America; sugar, raw cotton and tobacco to Britain.

Though there are still to-day more acres of sugar-cane in India than in any other country, half of the total output of cane-sugar in the world is grown in the West Indies and the lands of the Spanish Main. The island of Cuba alone produces about 4 million tons a year.

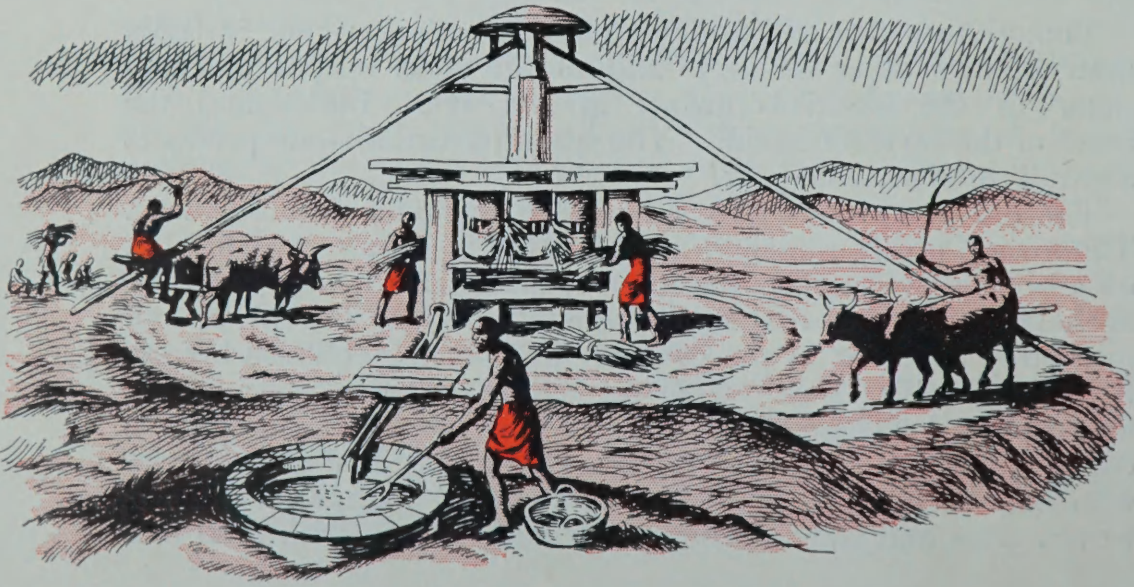
The old plantations were all worked in much the same way. The owner, or his manager, lived in "the big house", often built on a hillside overlooking the sea. It had high rooms, wide passages, large windows and shady verandahs where the owner and his family could sit in the evening to enjoy the cool sea-breeze. Behind "the big house" were the stables and the homes of the field-workers. These lived in prison-like rooms opening on a courtyard which could be closed and guarded at night. Slaves who had been freed were allowed to build themselves huts of woven grass and cane. They plastered the walls with mud and covered the roofs with reeds, palm leaves or banana leaves. These huts usually had only one room, with a hole in the wall which served as both door and window.

The plantation owner provided only the cheapest food for his workers—bananas and yams grown on the plantation and maize to be ground into porridge-meal. Sometimes there was some dried and salted cod-fish from Newfoundland, and at Christmas time there might be a special treat of a very little salt pork or beef. On this diet the young men and the stronger of the women had to work long and strenuous hours in the cane-fields and the sugar-mill.

Trade between the West Indies and Newfoundland began very soon after the first sugar plantations were made. What goods would you expect them to exchange?

Slaves were bought in Africa for bars of iron, but sold in the West Indies for barrels of tobacco, sugar or rum. Why did the Africans take payment in iron and the planters offer tobacco, sugar and rum?

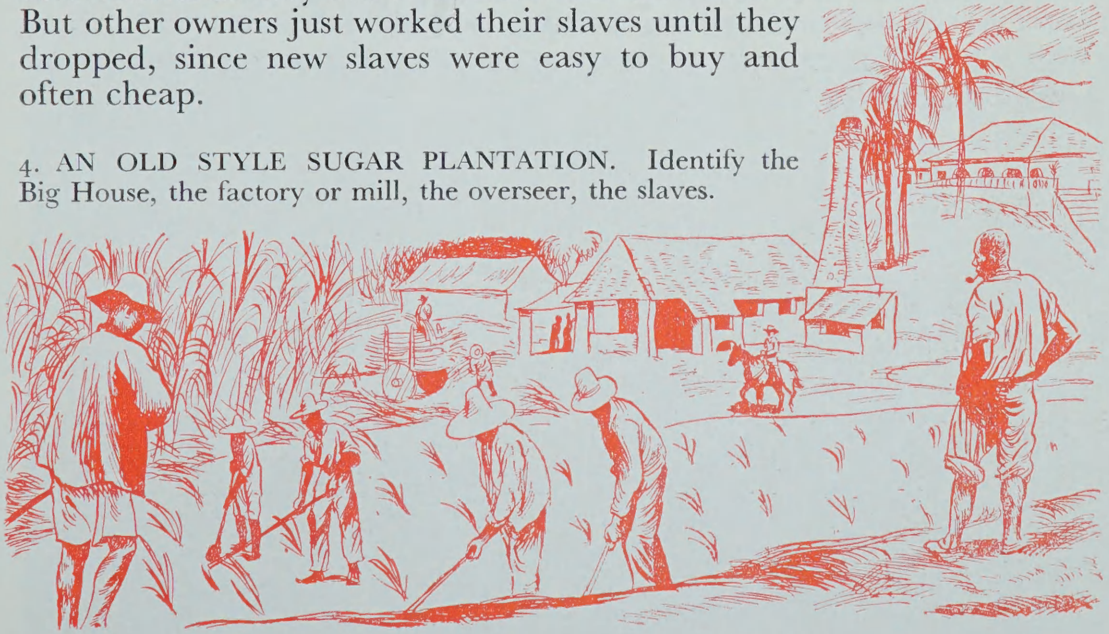
The drawing below shows an early type of sugar mill. Explain how it worked. The juice from the mill flows into the cistern in the foreground. What do you think the basket was used for? No means of evaporating the juice is shown. How then was the sugar got from it?



SUGAR AND SLAVERY

AS the sugar plantations increased in number, more and more workers were wanted. The slave trade was as profitable as the sugar trade, and Spanish, Portuguese, French, Dutch and British ships were all taking part. Sometimes the crews of the slave ships raided the African villages and carried off the young men and women. Sometimes they bought prisoners from African chiefs who had captured them in tribal wars. The miserable Africans were crowded into the holds of small ships and given just enough water and food to keep them alive until they reached the slave-markets in the West Indies.

Plantation life was hard enough for both master and slave. Sometimes there was fighting, especially between the French and British planters. Tropical diseases swept the islands and killed hundreds of slaves, for there were no doctors or hospitals to look after them. Every now and again too there might be a hurricane, when great winds blowing more than 100 miles an hour beat down flat the sugar-canes and the huts and sometimes even "the big house" itself. Some of the owners treated their slaves with kindness and justice, while others took as little interest in their health as they did in the health of their cattle. But other owners just worked their slaves until they dropped, since new slaves were easy to buy and often cheap.

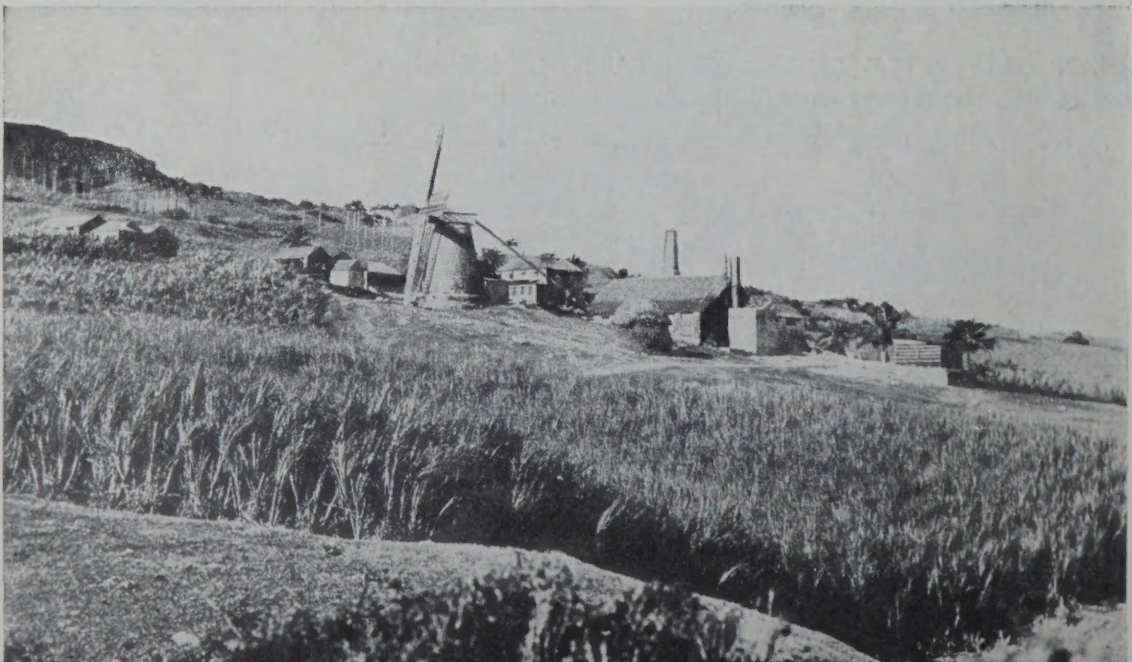


4. AN OLD STYLE SUGAR PLANTATION. Identify the Big House, the factory or mill, the overseer, the slaves.

The slave trade went on for about 300 years. It is believed that more than 10 million Africans were carried across the Atlantic to the New World. Thus it has come about that most of the people in many of the islands and some of the nearby coastlands are descended to-day from the slaves once brought from Africa to grow in America the sugar-cane first brought from Asia.

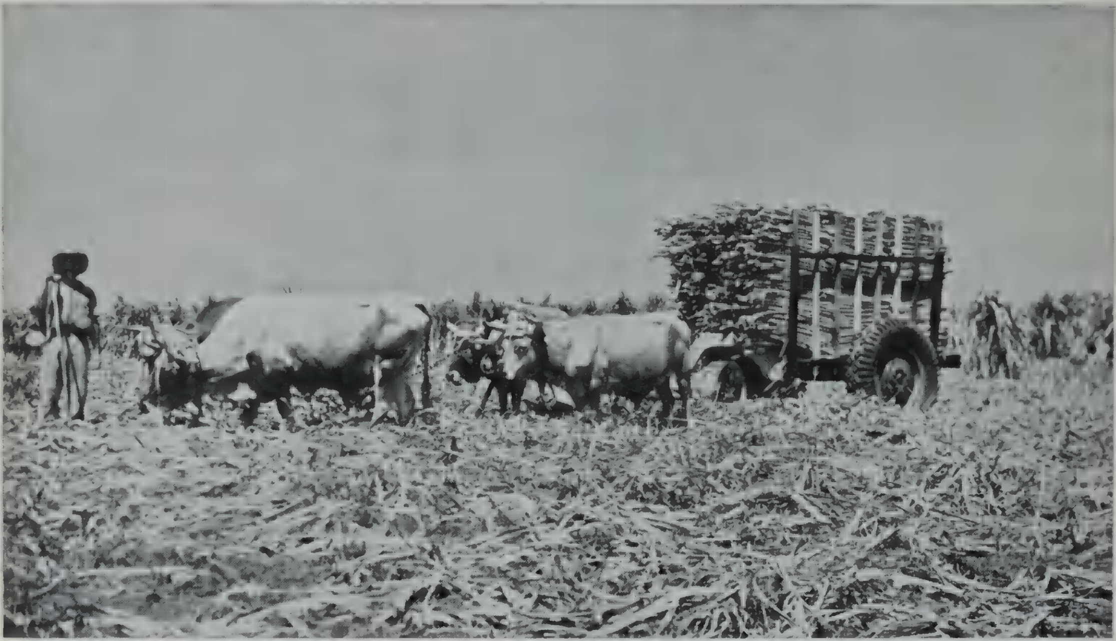
But at last in 1836 all slaves were freed in the British colonies, in 1848 in the French colonies and in 1863 in the United States. The end of slavery brought many changes to the plantations. Europe at this time had learned to use many machines, but the West Indian plantation owners had not been interested while slave labour was cheaper than machines. But the freed slaves found that they could live more happily by cultivating their own small plots of land. The owners had to offer them much better wages and conditions in order to tempt them back to the plantations. Many of the owners had not enough money to build new mills and use machinery instead of so much hand labour. Those planters who owned mills could force the planters who only grew cane to sell the cane to them at very low prices. In this way the mill owners became the new masters of the West Indies in place of the plantation owners.

5. OLD SUGAR FACTORY, BARBADOS. The windmill provided power for crushing the cane ; the chimneys rise from the evaporating house where the juice was heated and the sugar crystallized.



6. BARTICA, BRITISH GUIANA. The last southern settlement on the forest edge.

7. CUTTING SUGAR CANE. On a plantation in Cuba.



8. CARTING CANE, CUBA. Tops and leaves slashed off by the cutters litter the ground. They will be burned. What do the cart tyres tell you about the nature of the ground? What sort of animal is used to haul the cart?

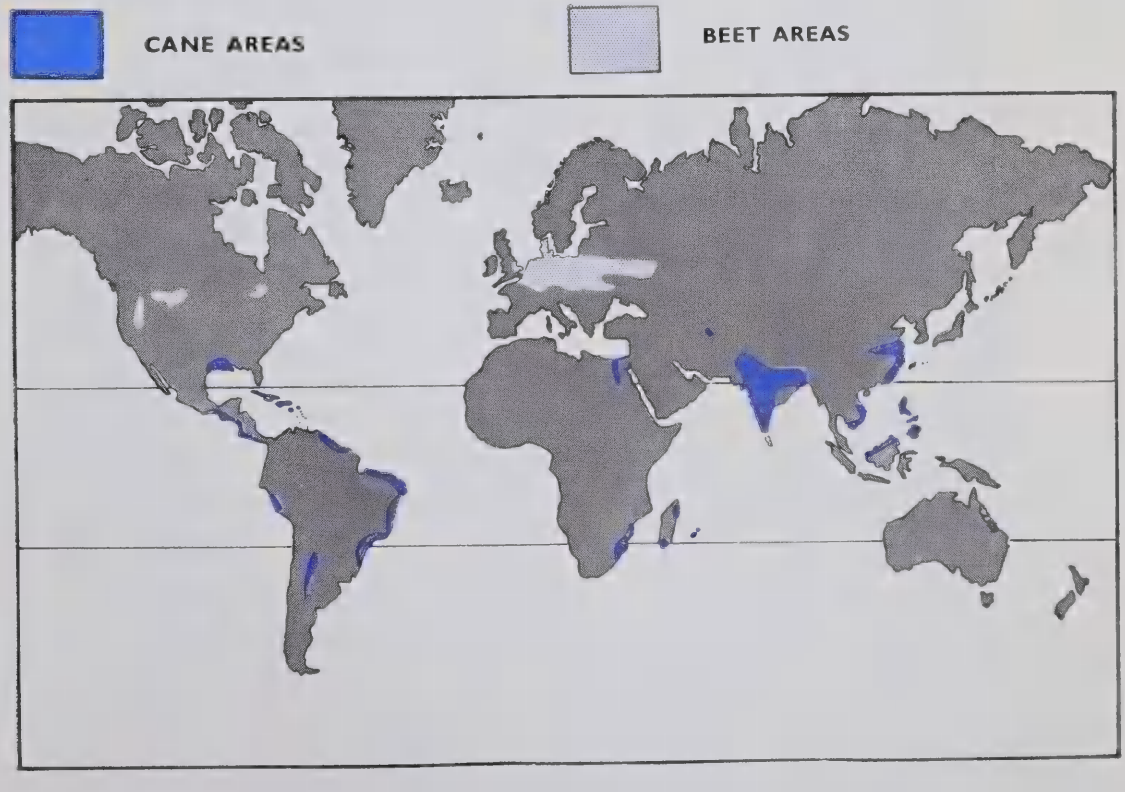
Something else too had happened since the plantations had been started. During the wars with Napoleon, the British fleet had stopped ships bringing cane-sugar to France. The French people were by now so used to sugar that they refused to go without it. It had always been known that small quantities of sugar could be got from the sweet juices of many plants beside the sugar-cane, so a French chemist set to work and found out how to extract it from the juice of the beetroot. Since then more and more sugar has been obtained in Europe and North America by growing sugar-beet in countries which are too cold to grow sugar-cane. To-day one-third of the world's production of sugar is from beet.

So the great days of prosperity for the sugar planters were ended. Some of them gave up growing cane and tried other crops instead. One of the crops they tried was tobacco. This plant, unlike sugar-cane, was discovered in America and needs very much the same climate as cane, but a different sort of soil. Some of the land in Cuba, for instance, was found to be excellent for growing tobacco, so many of the sugar workers there moved to the tobacco fields and cigar factories.

THE SUGAR PLANTATION TO-DAY

SUGAR-CANE is really a grass—one of the tallest grasses in the world. Some canes have stems 20 feet high and 3 inches thick, but the best canes are rather smaller than this. A growing field of sugar-cane is a beautiful sight. The canes grow in clusters from each root: green at first, but changing to yellow, red and purple as they ripen. The leaves, which are 3 or 4 feet long and 2 inches wide, grow out from joints in the stems of the cane. It takes from eight to fifteen months for the canes to grow and ripen and during all this time there must be no frost. And there must be plenty of rain to make the juicy plants grow so tall.

9. SUGAR-PRODUCING LANDS. What does the map show concerning the climatic conditions under which sugar cane and sugar beet are grown? Where would you mark the Equator on this map? All the cane areas except two adjoin coasts. Why? What method of cultivation must be used in the other two cases?



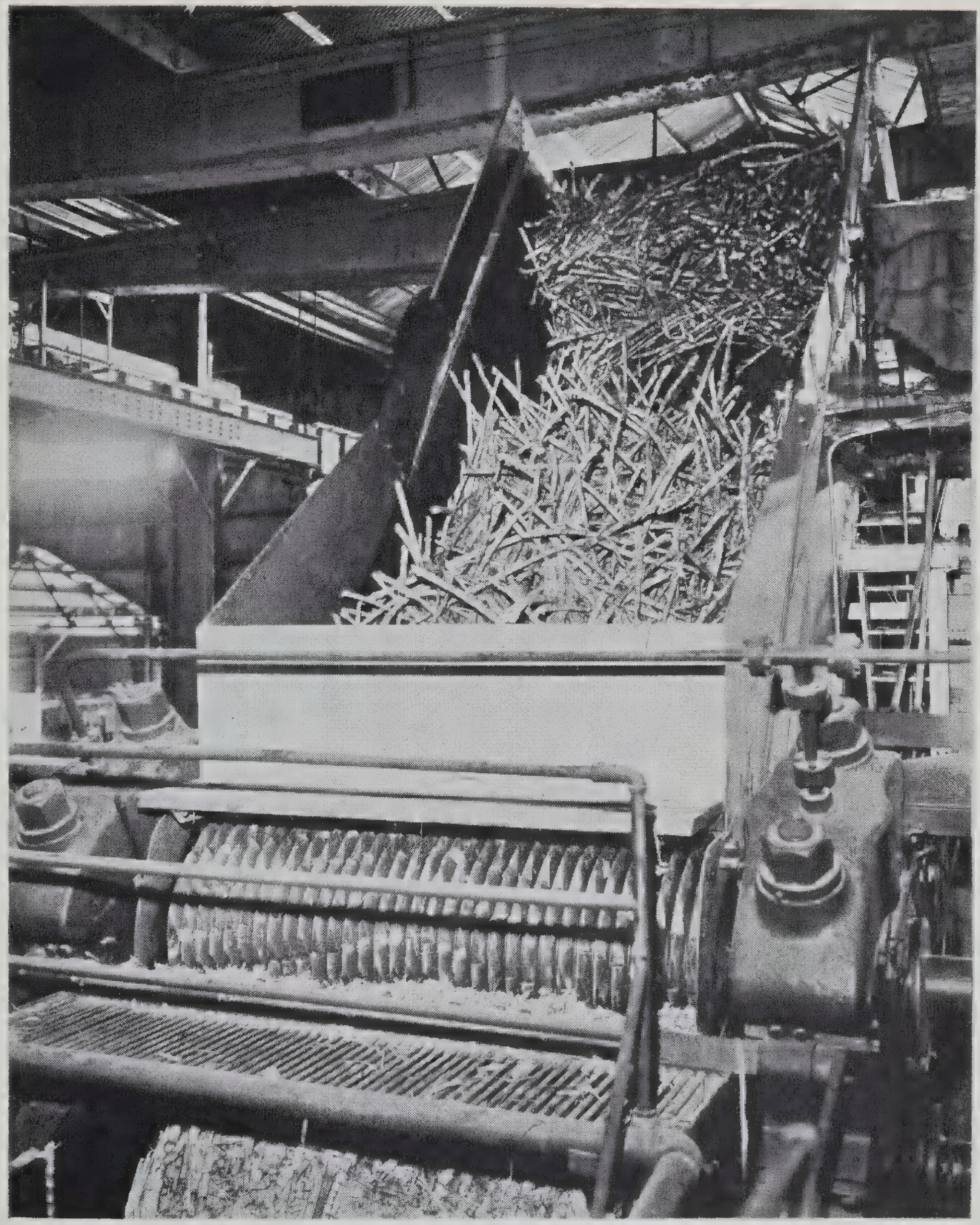
Sugar-cane grows well in a hot, damp climate—near the Equator so that it is always hot in the daytime; on coastlands near the sea so that it is never too cold at night and there is little change from season to season; where there is a rainfall of 45–60 inches spread out fairly evenly over the year. This rainfall is about twice the average rainfall in eastern Britain. If there is not enough rain the canes are short and woody instead of juicy. But if there is too much rain, the juice contains too much water and too little sugar. It is best also if the rain falls mostly during the growing season, with less rain when the canes are ripening. The growing canes take a great deal of nourishment out of the soil, so the planter chooses alluvial soils left by river floods, and uses a great deal of artificial fertilizer to restore the plant food to the soil.

New sugar plants are grown from short lengths of cane. But first the land must be cleared of the old growth, and then deeply ploughed and harrowed. Tractor-drawn machines are used nowadays for this work which used to be done with hand hoes and ox-drawn ploughs. Then the foot-long pieces of cane are planted by machine in deep furrows in the soil and a sprinkling of fertilizer is dropped at the same time. Another ploughing turns the loose soil into the furrows and buries the cuttings.

After the first showers the young plants shoot up from the joints in the cuttings. The canes grow fast and so do the weeds, which must be kept down by ploughing between the rows until the canes are tall enough to avoid being smothered.

When the flowers appear, the crop is ready for harvest. For a few days the juice in the canes increases in sweetness, and then very soon begins to dry up. So the planter has to choose very carefully the right time for cutting. The harvesters use long, broad-bladed knives to cut the canes near the ground and then to trim off the leaves and tops. As you can see from the photograph in fig. 7 the canes are much taller than the men who cut them.

Now the canes must be taken at once to the sugar-mill before they dry in the hot sun. The plantation often has narrow railway lines to take the heavy loads from the fields. From every acre an average of 30 tons of cane has to be moved to the mill: this great weight of cane will give about 3 tons of crude sugar. At the mill the canes are crushed between ridged rollers which squeeze out

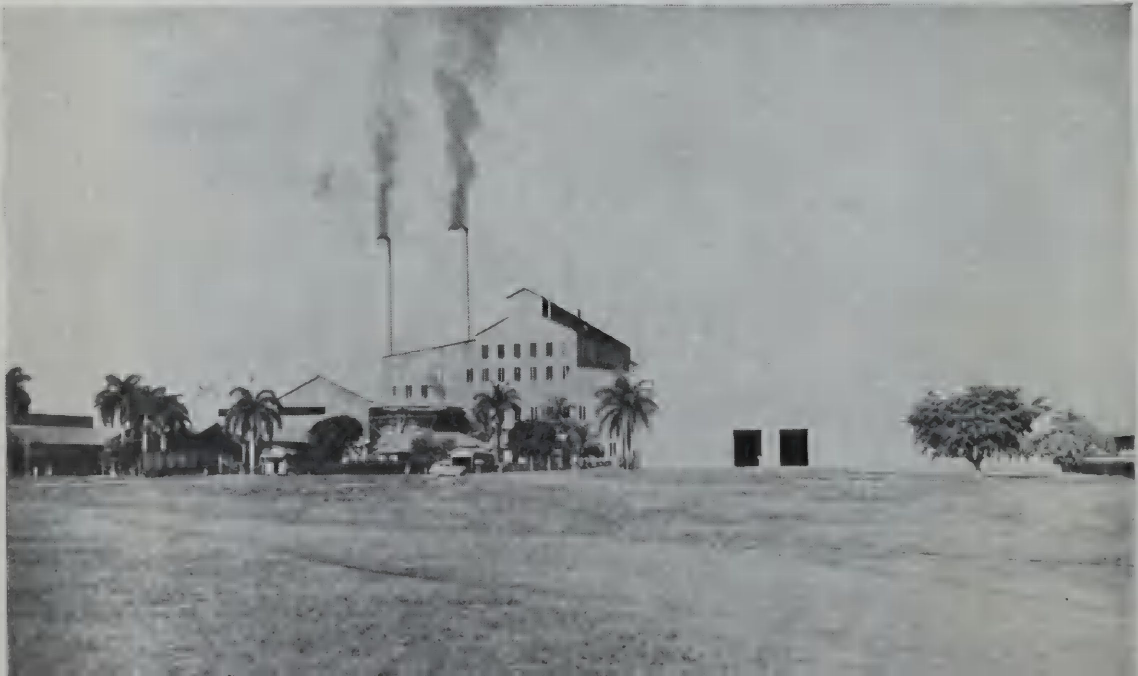


10. THE CRUSHER. The cane passes down the shoot and between two ribbed rollers which break it up and set free some of the juice. Other rollers press out most of the remaining liquid.

the juice. This brown, muddy-looking liquid is about nine-tenths water. It is strained through filters and lime is added to cause the impurities to form a sludge which can be drained off. The juice, now clear and yellow, is next heated in large closed pans. The water in the juice is turned into steam, which is taken away, and the sugar begins to form crystals. The sugar crystals are removed from the pans and dried by rapid spinning in metal cylinders with many tiny holes in their sides. This dried crude sugar is still light brown in colour, for some of the sugar syrup, now called molasses, still clings to the sugar crystals. The crude sugar is sent to refineries in Britain and other countries where it is purified still further by dissolving, filtering and crystallizing again and again until it is as white as snow. It is then packed in forms which suit the tastes and requirements of customers of many sorts. The molasses is exported as treacle or used for making rum or industrial alcohol.

Enormous quantities of crushed cane are turned out of a modern sugar-mill. Some of it is dried and then used in the boiler fires, which need a lot of fuel to boil the juice. Some of the crushed cane is treated and made into strong paper or fibre-boards for covering walls and ceilings.

11. A MODERN REFINERY, HONDURAS. Large refineries like this one handle the cane from many plantations. What steps have been taken to keep the working places as cool as possible? How can you tell that this photograph was not taken in England?



Not so much labour is needed nowadays to run a sugar plantation, but the railway lines to the central sugar-mill and the mill itself cost a great deal of money to install. So to-day most of the West Indian plantations are owned by large companies which control the mills and let out portions of the estates to tenants who plant and grow and harvest the cane.

Study the Farmer's Calendar below and then answer these questions:

Why does the temperature in Guiana vary so little during the year?

The farmer talks of "the big rains", "the little rains", and the "dry season". At what time of year does each come?

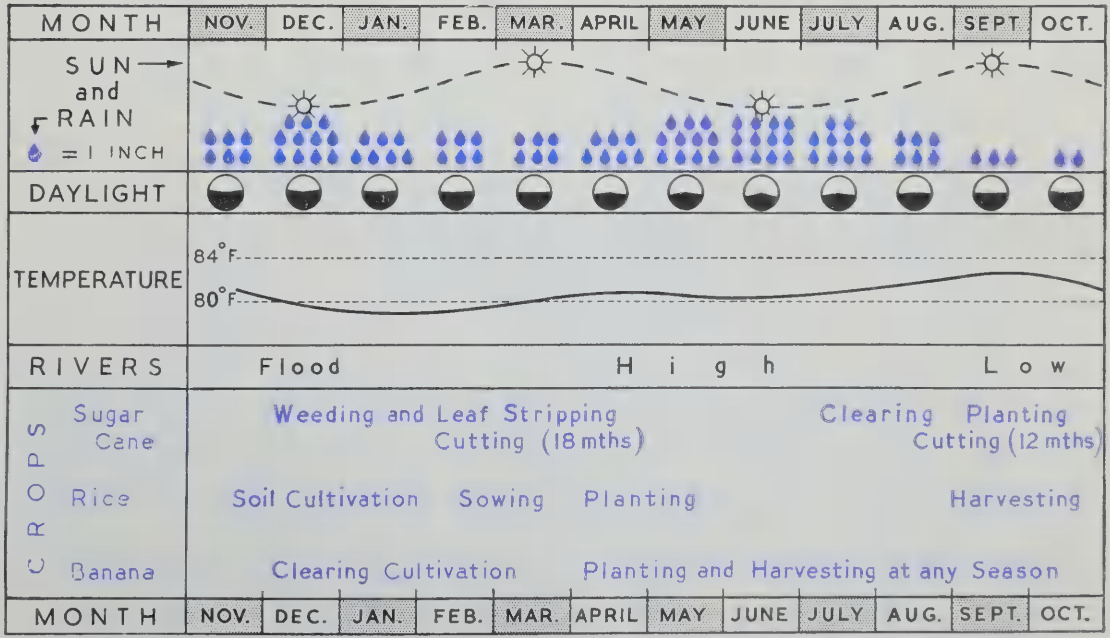
Clearing new ground, ploughing the cane fields and planting cane, take place from August to October. Can you explain why then?

Some canes ripen in 12 months, others in about 18 months. Can you see any connection between the cutting times and the rainfall? Remember that moisture is needed to produce juice and sunshine is needed to increase the sugar in it.

Rice is sown on a seed bed and the seedlings are transplanted in the fields later. Why is sowing done in February rather than in August?

Why does the banana grower plant in all seasons?

12. THE GUIANA FARMER'S CALENDAR.

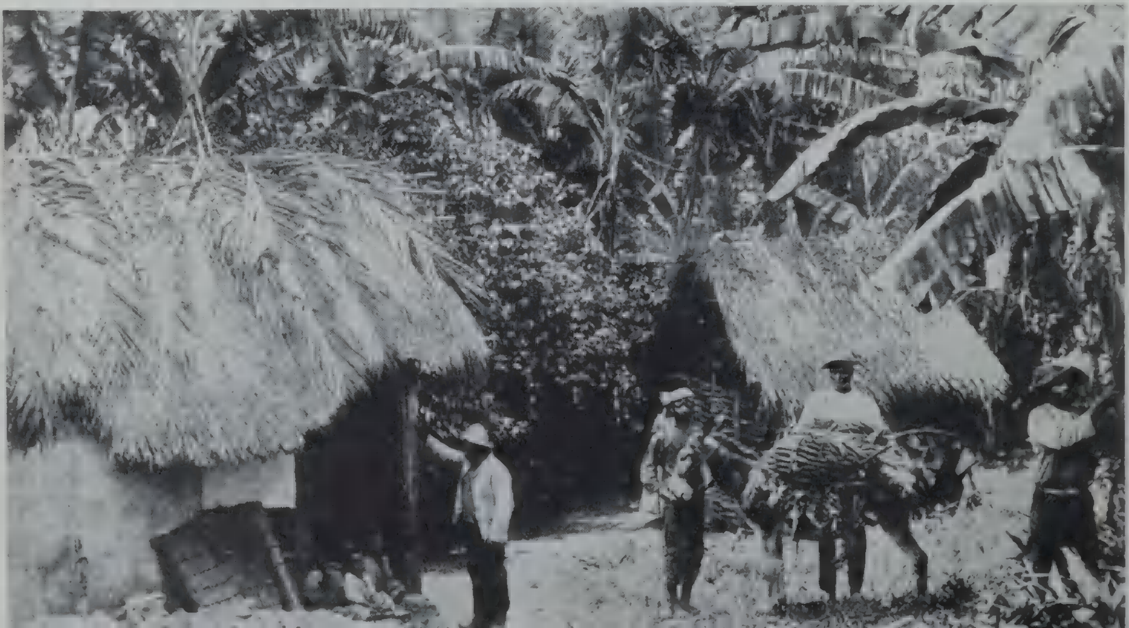


THE banana you buy in a shop has also been grown on a plantation owned by some big company.

Bananas grow all over the tropical countries, wherever there is no frost and where there is a steady rainfall of 60–75 inches of rain a year. Land that suits sugar-cane can usually grow bananas too. The banana is an important food to many people in these parts, so everywhere you will see a few banana plants growing. The fruit must be cut before it is ripe and hung up in the shade for a fortnight before eating. Some of these bananas are more starchy than the sweet ones you know and are cooked or dried and made into flour. The big tough banana leaves are used for wrapping food and covering the roofs of huts.

Bananas lose their taste and go bad very quickly. So it is a difficult matter to get them from the West Indies to your house. They must be cut before they are ripe, they must not be bruised at all, they must be kept at an even temperature all the time—neither too hot nor too cold—to prevent them rotting. So it is only during the last sixty to seventy years that bananas have

13. HOME OF A JAMAICAN PEASANT. The mud-plastered house is roofed with palm leaves and a mat made from the midribs of the same leaves forms the door. The second building is a kitchen.



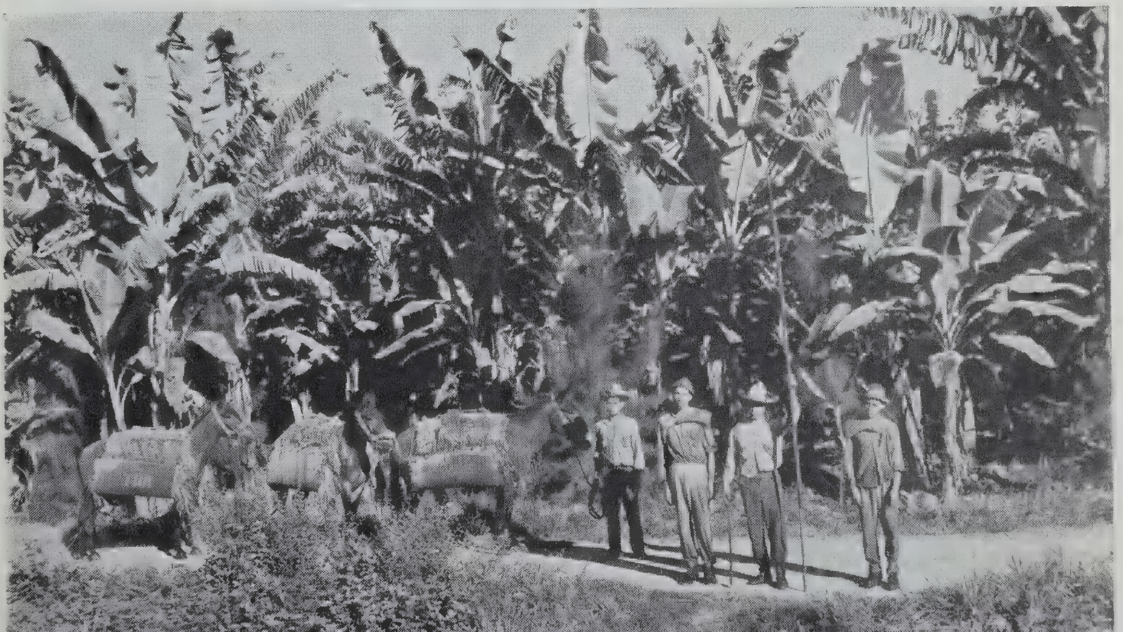
been grown for export. The banana industry could not be developed until refrigeration had been invented and special ships built. The companies that built the ships found that they could not rely on buying from planters enough bananas which were all just at the right degree of ripeness at the time their ship called, so the companies started their own plantations to produce the bananas for their banana boats.

A plantation is usually made in a level stretch of forest jungle. The plantation will be on an island or on the coastlands of the Spanish Main, for it must be near enough to a port to allow the bananas to be put on board immediately after cutting.

All the jungle undergrowth is first cleared away, leaving the tall trees still standing. Then the bananas are planted. They are not grown from seeds but from pieces of the underground stem of the plant. Each piece is buried about a foot down in a hole and staked. Before the plant begins to sprout, the big trees are felled and left lying where they fall. The fallen trees shelter the young plants and help to keep the soil moist.

About three months after planting, the plantation has to be cleared. The shoots of young trees and the branches of the felled trees are lopped off so that the young banana plants can get

14. A CUTTING GANG ON A BANANA PLANTATION. The cutter carries the long-handled slasher to cut the top and the sword-like *machete* to sever the bunch. The catchers have shoulder pads to prevent bruising of the fruit.



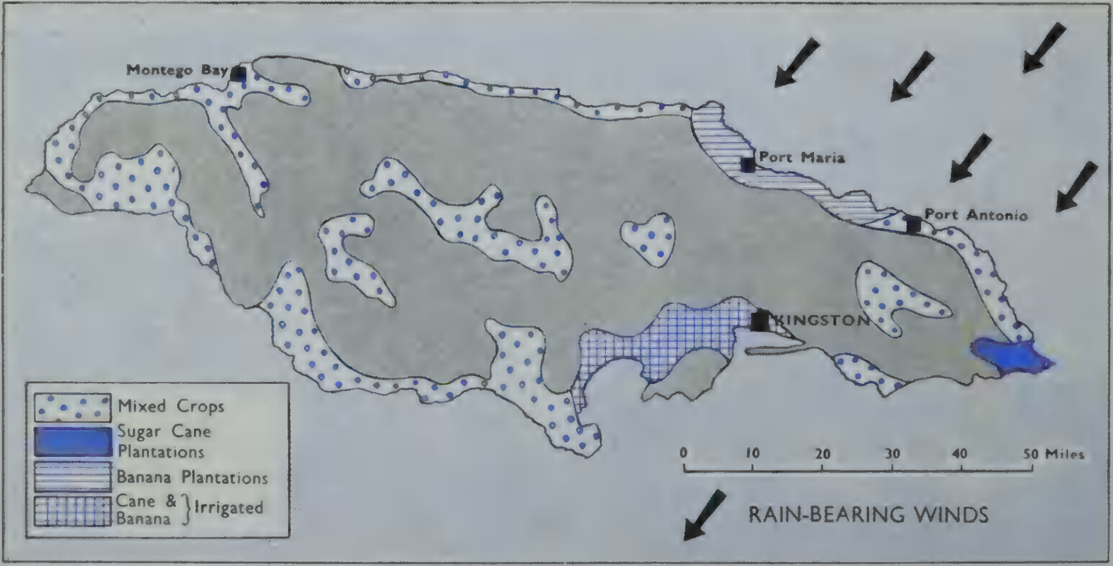
sun and air. All the clearings are left lying on the surface of the ground. Within a year little of them will be left, for in the damp heat they soon rot away and millions of wood-eating ants speed their destruction.

As long as there is a banana plantation this clearing process has to be repeated every three or four months. If neglected the plantation soon becomes jungle again.

When the clearing is made each of the banana cuttings is reduced to three or four shoots. The young plants grow quickly and in fifteen months are 15–30 feet high. They are not trees, for what looks like a trunk a foot thick is just a mass of sheaths from which the leaves spring. The leaves at the top of the plant are 2 feet wide and 8–10 feet long. Out of the midst of the sheaths springs a flowering stem on which several clusters of the fruit grow. There may be 50 lb. of fruit on one stem, so it soon bends down, though at first the bananas develop upside down.

As soon as a plantation manager hears that a banana boat is arriving, he begins the cutting of the fruit from the plants which started growing about fifteen months before. 75,000 bunches a day will be wanted. The fruit must be cut and carried and loaded on the ship all in a few hours, so work starts at daybreak.

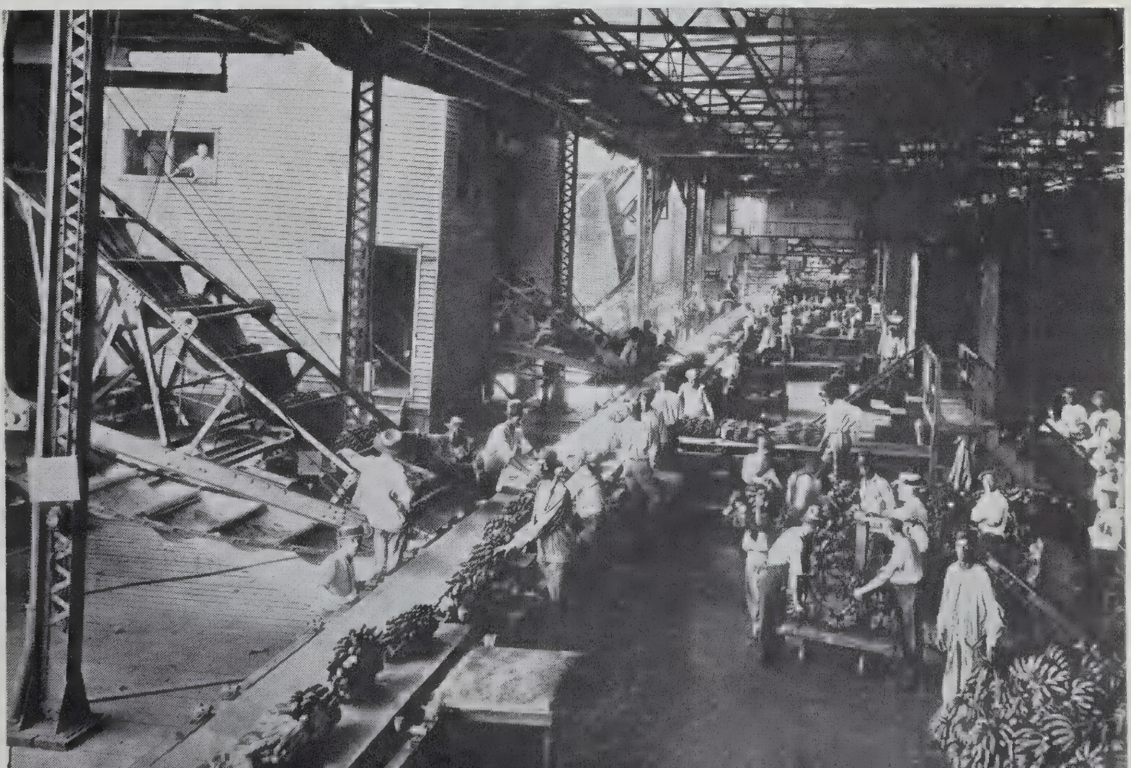
15. JAMAICA. Much of the island is too mountainous for cultivation. The north-east trades are the main rain-bearing winds. Why are some of the cane and banana plantations irrigated and others not? The mixed crop areas are mainly occupied by families employed in growing their own food.

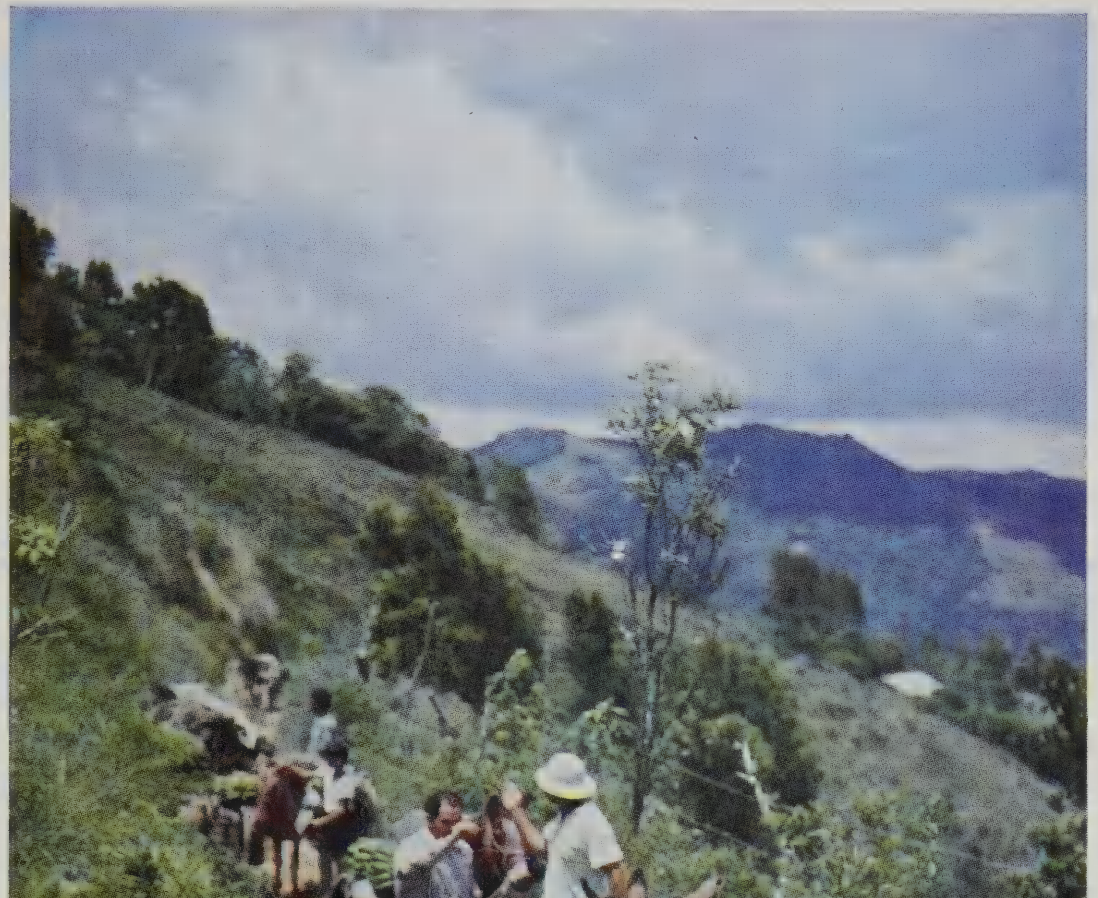


The cutting is done by gangs of three or four men. The cutter slashes through the stem of the bunch of fruit with a sort of broad sword while the backer-up takes the fruit gently on his shoulders and carries it to the mule-man, who fits it into a canvas sling on the back of the mule. When five bunches have been cut, the mule carries them to be loaded on trucks running on a tramway which leads down to the ship. The ground is too soft and full of decaying leaves and trees to be able to support a lorry but the mule can pick its way and easily draw the truck on the tram-lines.

Great care has to be taken at each stage to avoid bruising. A bunch with one bruised banana on it will not be loaded on the ship. In the cooled holds the bunches lie on racks so that they do not touch and cannot shift with the movement of the ship. The fruit goes on ripening in the holds and gives off carbon dioxide as it ripens, so the holds must be well ventilated. While the ship is in tropical waters the ventilating air must be cooled, but the holds are warmed as the ship reaches colder waters.

16. UNLOADING BANANAS, NEW ORLEANS. Canvas conveyor belts carry the fruit from ship to wharf and along this to railway wagons.





17 (left) CUTTING BANANAS. The catcher reaches for the bunch as the cutter draws it down.

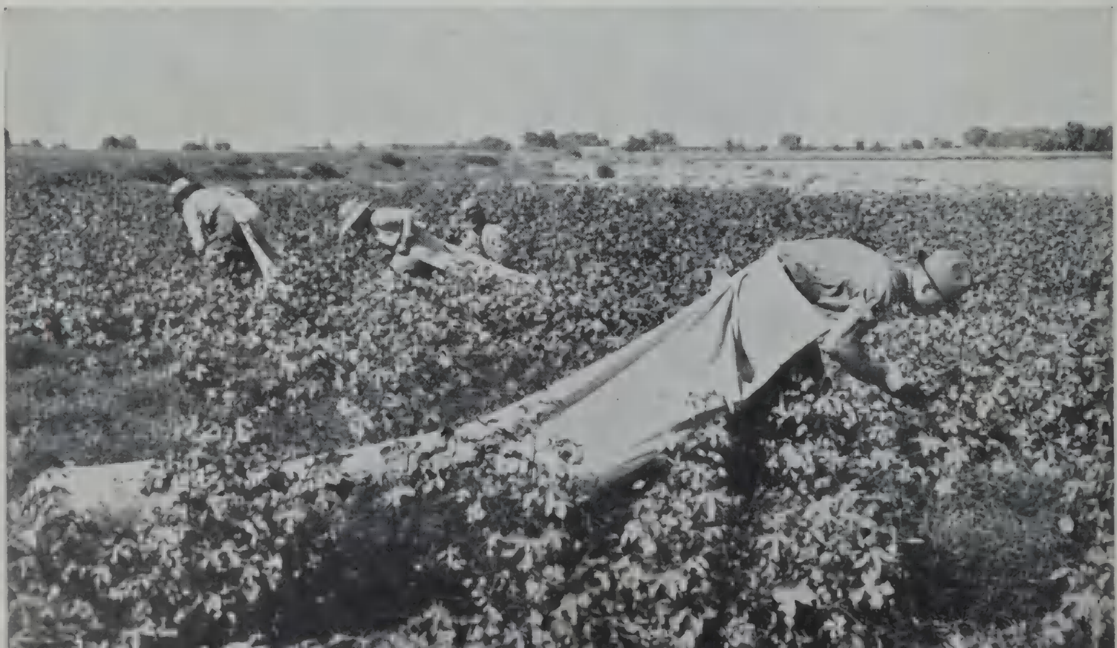
18 (above) CARRYING BANANAS. The bunches are held in carefully padded slings.

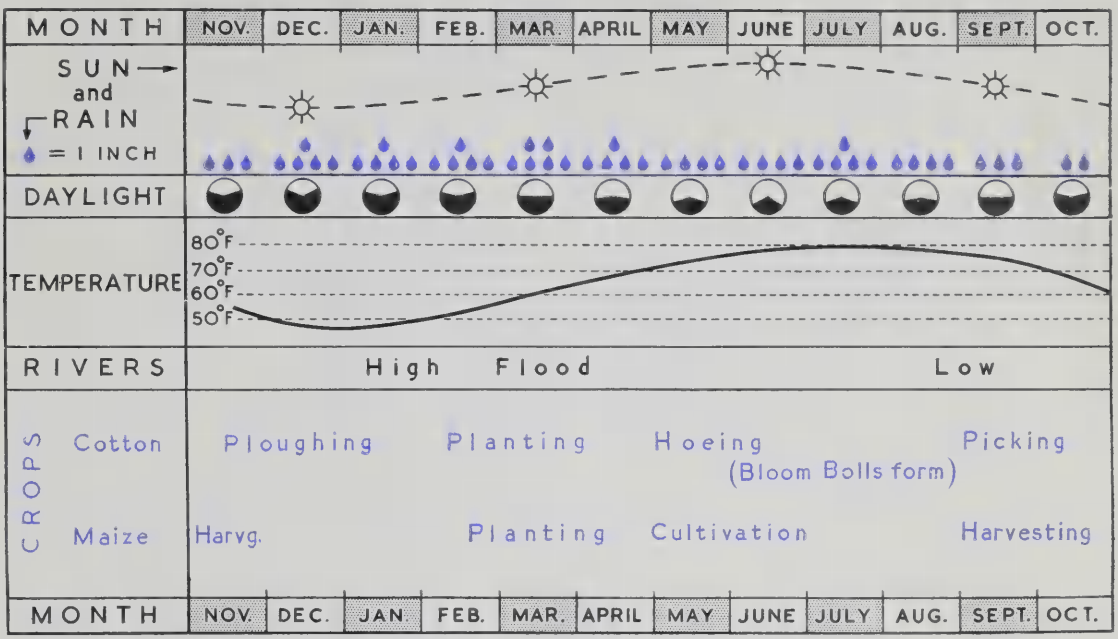
GROWING COTTON

MOST people in the world use some clothing made of cotton cloth and in hot countries it is often the only sort of clothing known. Yet cotton, like sugar, was once a luxury in Europe. Some cotton cloth used to be brought from the East, as you can tell from some of the names, for calico first came from Calicut in India and muslin from Mosul in Iraq. But there was never any cotton for the poorer people in Europe until cotton was planted in the West Indies, Brazil and the Spanish Main.

Cotton cannot be grown in the same areas as the sugar plantations or the later banana plantations, for it is too wet in these parts for cotton to ripen. But men found that in some parts of the islands where there was much less rain, cotton would grow well. Then they found that if they went north of the wet coastlands of the Gulf of Mexico, they found still better conditions. Over a great area of the southern states of the United States, cotton became the chief and almost the only crop. From this Cotton Belt there still comes nearly half the world's production of raw cotton.

19. PICKING COTTON. Much of the seasonal work in the western cotton fields of the United States is now done by Mexican labourers. Here they are picking the cotton bolls into the long bags they drag behind them.





20. THE COTTON BELT FARMER'S CALENDAR. Why does he take his holidays in July and engage extra workers in May and September? Unlike wheat, maize can be left standing in the field after it is ripe. How is this helpful to the cotton belt worker? How do rainfall and temperature conditions differ from those in the sugar cane and banana growing lands?

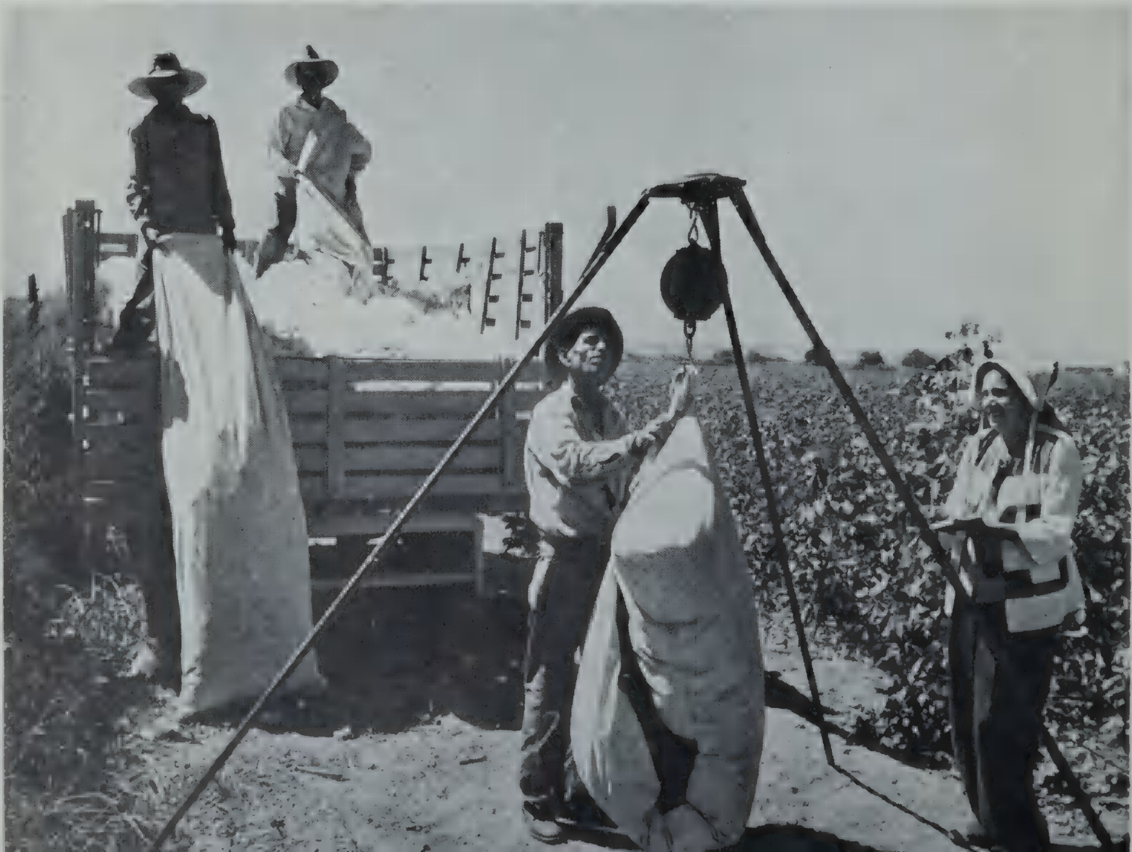
Cotton does not need a hot climate all the year round like sugar and bananas, but it must have seven months to grow in which there are no frosts at all. So this sets a northern limit to the growing of cotton and confines it to the edges of the tropical regions. Like sugar-cane, cotton-growing needs a great deal of labour, and this used to be much more so in the past than to-day. Cotton grew best in the wooded lands, so the trees had to be cleared and the ground ploughed. Then the seedlings had to be thinned and hoed and kept free from weeds. The seed pods which contain the cotton fibres do not all ripen at the same time, so the cotton-pickers had to pick over the cotton fields two or three times. Worst of all, the cotton fibres are attached to the individual seeds in the seed pod, so all the seeds had to be detached by hand from the fibres.

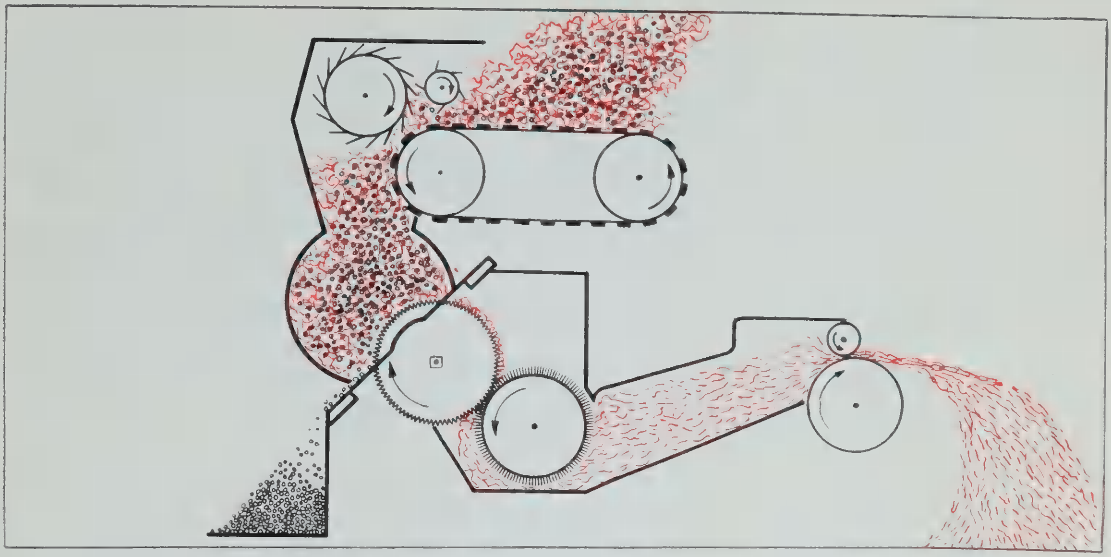
THE COTTON PLANTATION

THE cotton plantation was started, like the sugar-cane plantation, with slave labour from Africa. There was plenty of work for the whole family, the men clearing the forest and ploughing and hoeing, while the women and the children thinned the plants and picked the cotton and pulled the cotton-fibres from the cotton-seed. As soon as one cotton crop had been harvested, work was started on new clearings, for the cotton crop quickly exhausted the soil and the same land could not go on growing cotton year after year.

Then in 1793 the cotton gin was invented. This was a machine for separating the cotton seeds from the fibres. In the cotton gin circular saws with fine teeth are mounted on a revolving shaft and pass through slots into the bin which is filled with the cotton brought from the fields. As the saws rotate, the teeth catch the

21. HOW MUCH HAVE I EARNED? The picker watches anxiously whilst his picking is weighed before being emptied into the cart.

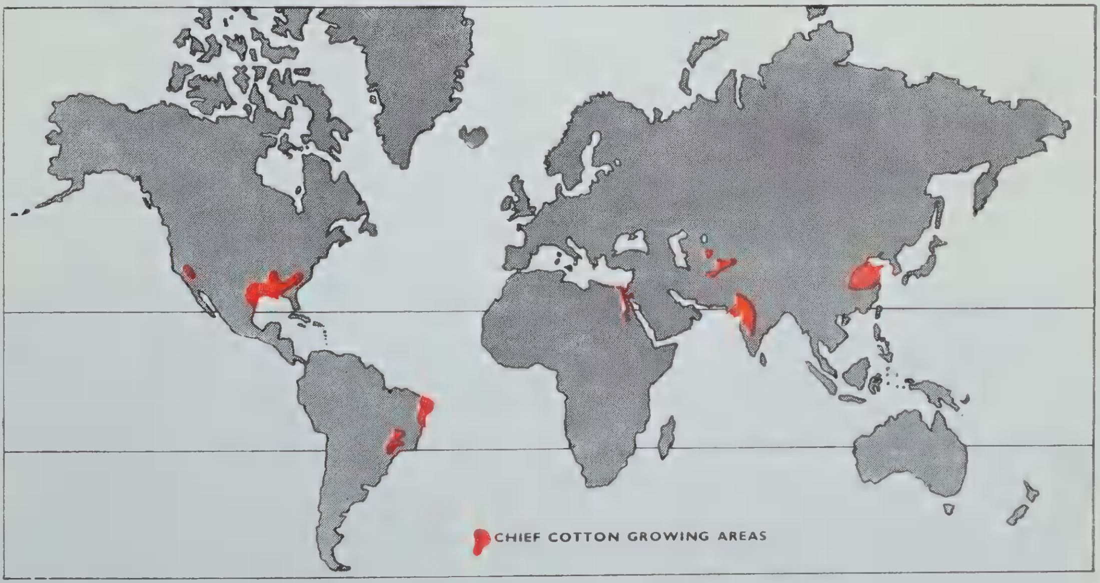




22. HOW THE COTTON GIN WORKS. Cotton as it comes from the fields falls on the belt and is pushed along by the toothed wheels to fall on the grid. The fibres are drawn through this by the saw teeth and swept from them by the revolving brush. Thus the gin separates the seeds from the fibres. The seeds are about the size of peas.

The fibres of American-type cotton are little more than an inch in length : this is called *short-staple* cotton in contrast with the slightly longer staple of most Egyptian cotton.

23. COTTON GROWING LANDS. These are all near the tropics. The United States produces nearly half the world's supply, no other country as much as one-eighth.



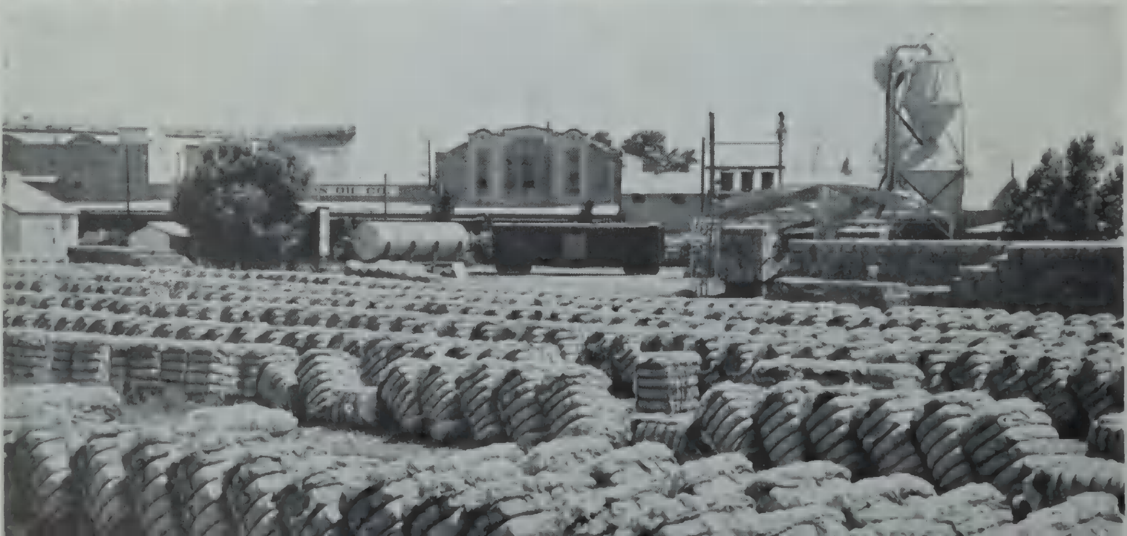
fibres and draw them through the slots. The slots are too fine to allow the seeds to pass through, and in this way the seeds are forced away from the fibre. It was the invention of the gin which first really made cotton cheap enough to provide clothing for everybody. Before the invention of the gin, the United States produced only 4000 bales of cotton a year. Eight years later the United States was producing 100,000 bales a year. The new cotton factories of Lancashire could at last get all the cotton they needed at a cheap price.

To-day the United States produces in some years as much as 18,000,000 bales. Yet the Cotton Belt has had a long struggle against many difficulties.

The ending of slavery brought even more trouble to the cotton planter than to the sugar-cane planter. For slavery was not abolished in the United States until the Civil War between the North and the South. The South lost the war and the slaves were freed in 1863, but all the Cotton Belt was left very poor. The freed slaves did not want to work on the cotton plantations, yet cotton-growing was the only work they knew how to do. What had been for the cotton planter the prosperous South became a land of poverty for everybody and until recently has lagged far behind the rest of the United States.

Then, only forty years ago, the boll weevil threatened to destroy the whole crop. The boll weevil is a tiny beetle which lays its eggs in the young plant. The grubs from the eggs eat

24. A RAILWAY STATION IN THE COTTON BELT. Bales of ginned cotton wait for loading. In what month do you think the photograph was taken? The factory in the background extracts oil from the cotton seeds.



their way into the growing pods and destroy the fibre. In the eight months of the cotton season, one pair of boll weevils may become the parents of millions. In a few years the cotton crop was reduced to nearly half. (A cousin of the boll weevil, called the sugar-cane borer weevil, is a handsome green beetle whose larva bores into the roots of sugar-canes and of bananas.)

Finally it has slowly been realized that the best of the cotton soils were being destroyed by the method of cultivating the cotton plantation. Clearing the forest, taking the goodness out of the earth to raise the cotton crop and then moving on to a new clearing has left the top-soil of millions of acres so loose that the heavy rains wash it away. This erosion has turned rich land into poor land.

Many ideas are being tried to make the Cotton Belt less poverty-stricken. Aeroplanes spray the fields with insecticides to destroy the boll weevil. Other crops are planted in strips between the cotton fields and the ploughing is so done that the rain does not wash away the soil so easily. Pigs and cattle are being kept in increasing numbers to provide another source of income for the cotton-growers. And the Cotton Belt itself is moving westwards. As less cotton is grown on what were once the best soils near the Atlantic and in the Mississippi valley, more cotton is grown in Texas and California. There is not nearly so much rain in these districts and this means that the cotton crop is much less per acre. But the land is flat and easier to work, so the ploughing and hoeing can be more easily done by machines. Since the climate is drier the cotton boll can be left on the plant a few days longer after ripening, and this makes it possible to use a mechanical picker. Cotton-growing to-day is becoming less and less like the old ways of the plantation which depended for everything on an endless supply of cheap slave labour. Texas never knew the old-time slave plantation.

Tell the story of cotton all the way from planting to cloth.

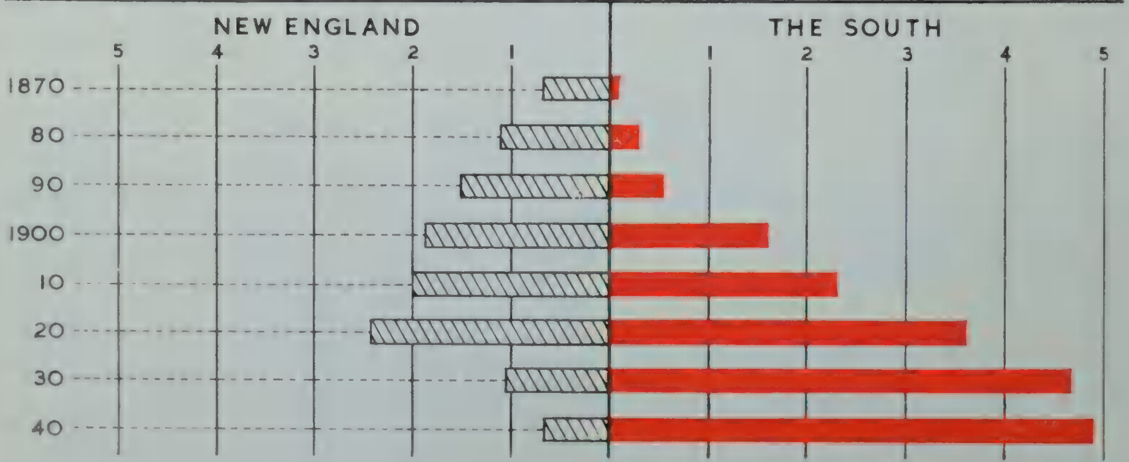
FROM PLANTATION TO FACTORY

THERE is yet another development in these southern cotton states. They now do more than grow the cotton, they also manufacture much of it into cloth. Once nearly all the cotton went to Lancashire or to the cotton-mills of New England. But in recent years more and more cotton cloth has been manufactured in the South itself. There are several reasons for this. For one thing there are plenty of workers available in the Cotton Belt who welcome jobs in mills instead of on the fields. The wages need not be so high as in the North, for the warmer climate means that clothes and houses are cheaper and so a lower wage gives the same standard of life. Finally, cheap power has been made available by harnessing the rivers from the hills and building hydro-electric power stations.

Cotton too has been turned to other uses than just making cotton cloth. Out of the cotton seeds which used to be thrown away, a valuable oil is extracted. The best of this oil is used in place of olive oil and in making cooking fats, while the poorer grades are used to make soap and candles. The crushed cotton seeds which are left are made into cotton-seed cake or meal for fattening pigs and cattle. The short fibres still left on the cotton seeds

25. COTTON MANUFACTURE IN THE U.S.A. From the early days of the cotton plantations cotton was manufactured in New England mills. Especially since 1900, mills for its manufacture have been built in the south and most of the cotton is now sent to mills near the fields. Swift rivers provide electric power for the mills.

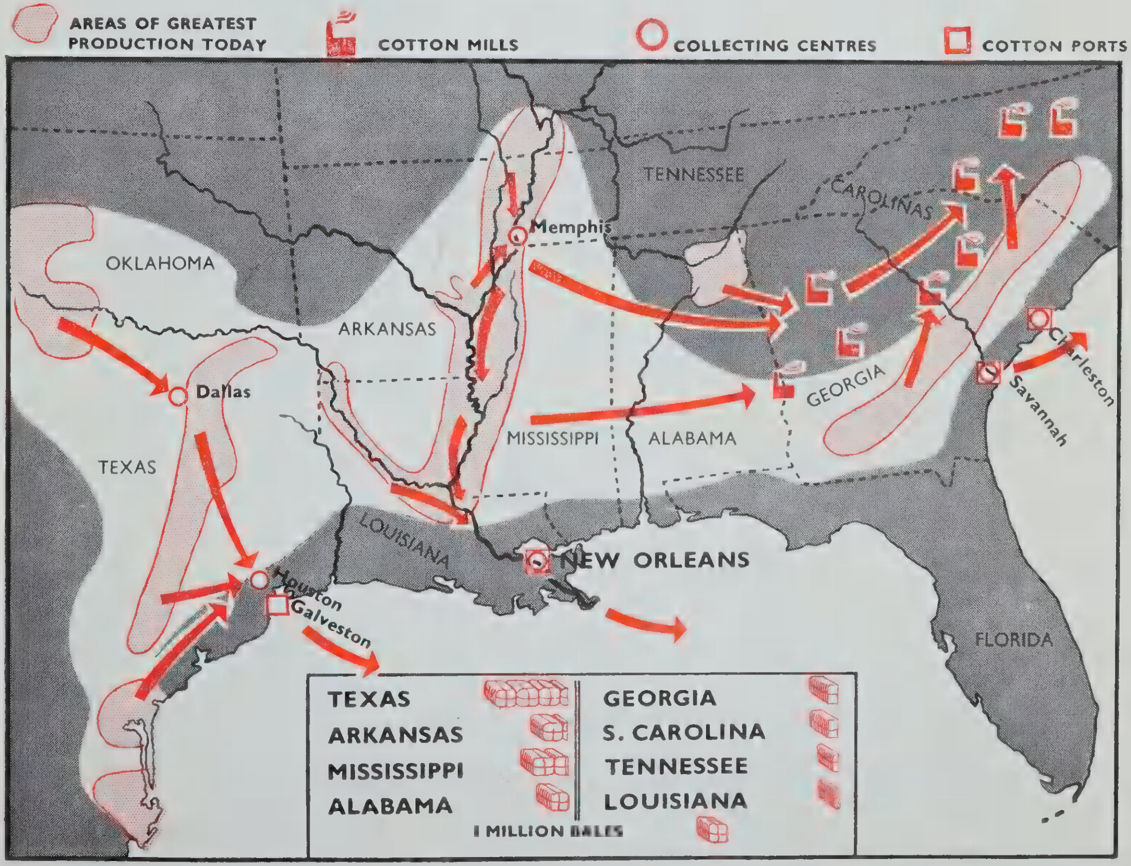
COTTON USED IN AMERICAN TEXTILE MILLS (MILLION BALES)



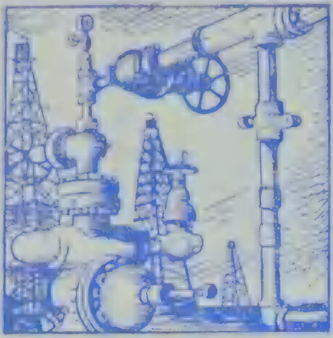
after ginning can be used to make rayon, the man-made textile which is increasingly being mixed in the weaving of cotton cloth. And the same factories which make the rayon can also use the crushed cane from the sugar-mills and the waste timber from the forests to make paper and cardboard and fibre-boards. Thus manufacturing industries have come to the "sleepy South".

About half the cotton grown on the belt is manufactured in the South, one-sixteenth in New England and the rest exported, mainly to Europe. The south-eastern states used to be the main producers and exporters. Which are now? Cotton field workers used to be wholly negro but are now largely Mexican; mill workers were almost all Europeans but are now largely negro; more than half the cotton used to reach the coast by river boat, now more than half does so by rail. Can you give any explanation of these changes?

26. THE COTTON INDUSTRY AND THE COTTON BELT.



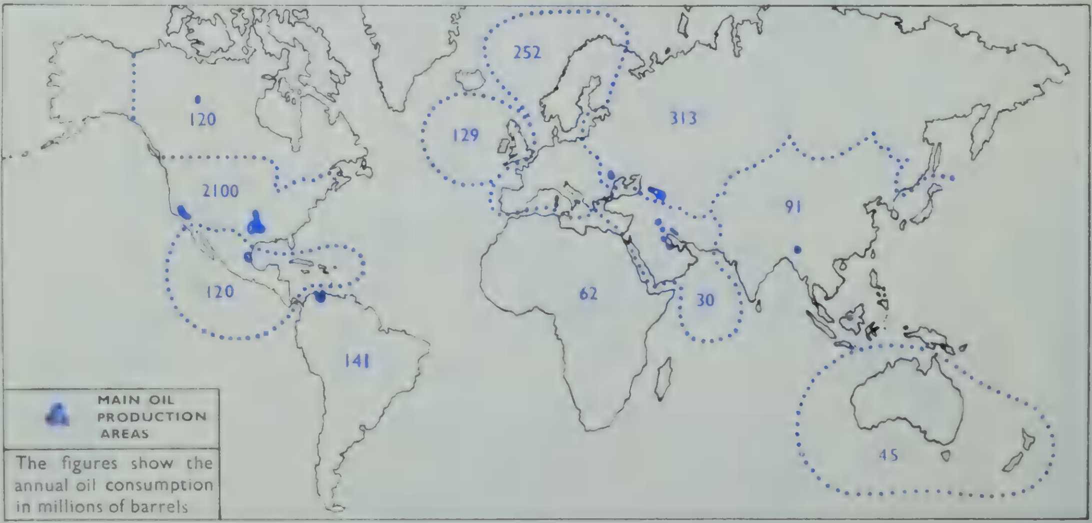
OIL IN THE CARIBBEAN LANDS



SUGAR-CANE, bananas and cotton are products of the soil, but there is a rich product which comes from the rocks deep beneath the soil. This product—petroleum—has brought more wealth to the lands of the Caribbean Sea and the Gulf of Mexico than the gold and silver that the Spaniards found.

Men have known for centuries that in some parts of the world oil could be obtained from the rocks beneath the earth's surface. This crude oil, or petroleum, is held sometimes in the pores of fine-grained rocks such as sandstone, much as water is held by a sponge. Sometimes it fills the joints or cracks in the rocks, as water is held in limestone. Always it is seeking to rise to the surface, and so from ancient times it has been found in springs where it oozes through the surface soil. But until about a hundred years ago no one was very interested in petroleum. About 1850 it began to be used in lamps, but it had two serious drawbacks. Sometimes the oil exploded instead of burning quietly, and always

27. OIL PRODUCTION AND CONSUMPTION. The main producing areas are U.S.A. (Texas and California), Venezuela, the Persian Gulf lands, and U.S.S.R. Identify each on the map.
Which are the main consuming countries? Try to explain their order on your list. For what purposes is the oil used?


252
120
313
129
2100
91
120
62
30
141
45
MAIN OIL PRODUCTION AREAS
The figures show the annual oil consumption in millions of barrels

the lamps smoked and smelled badly. Then someone discovered how to separate a safe, clean-burning paraffin or kerosene from the light petrol (which caused the explosions) and from the thick oil (which produced the smoke and smell). At once there was a great demand for the new refined oil, and men began to search for it—at first in a rather hit-or-miss manner.

The first oil well was sunk in Pennsylvania in 1859. This was so profitable that many more wells were drilled throughout the United States. Few were successful until the Californian wells began to be worked in 1880. Then still richer areas were discovered in the south, in Mexico and in Texas in 1901, in Trinidad in 1908, and in Venezuela in 1917.

The invention of the motor-car and then of the aeroplane enormously increased the demand for petroleum. The petrol which was such a nuisance to the kerosene-makers became now the most important product. Oil became the most useful fuel in the world, easier to transport and handle than coal, easier to use and more efficient in use. Apart from cars and trucks and many railway engines, most ships are now driven by oil. Many houses in America are heated by oil. And in all parts of the world every moving part in every machine needs the lubricants which are produced from oil. In the last fifty years men have searched for oil in nearly every land and even below the sea. They have sunk wells thousands of feet into the earth's crust. They have built great refineries where the oil is separated into fine petrols, kerosenes and thicker oils, which are all used for different purposes. And they have discovered numerous uses for all the products of petroleum. The discovery of new oil-fields has brought wealth to many lands where before there was poverty. This has happened in the southern United States and in the lands bordering the Gulf of Mexico and the Caribbean Sea.

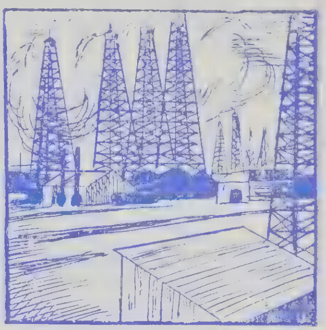
Several oil refineries have been built recently in Britain. How many of them can you name? Where have they been built? Can you suggest any reasons for erecting them in these places? Britain produces very little crude oil. Why then does she build refineries?

Though huge quantities of oil are already being drawn from the earth, the search for new oilfields still goes on. Why? A great new field has been found on the Canadian prairies. How will it help the prairie farmer?

28. COTTON PICKING. The background shows the kind of country that had to be cleared for planting.

29. DRILLING FOR OIL in the swamps of the Mississippi.

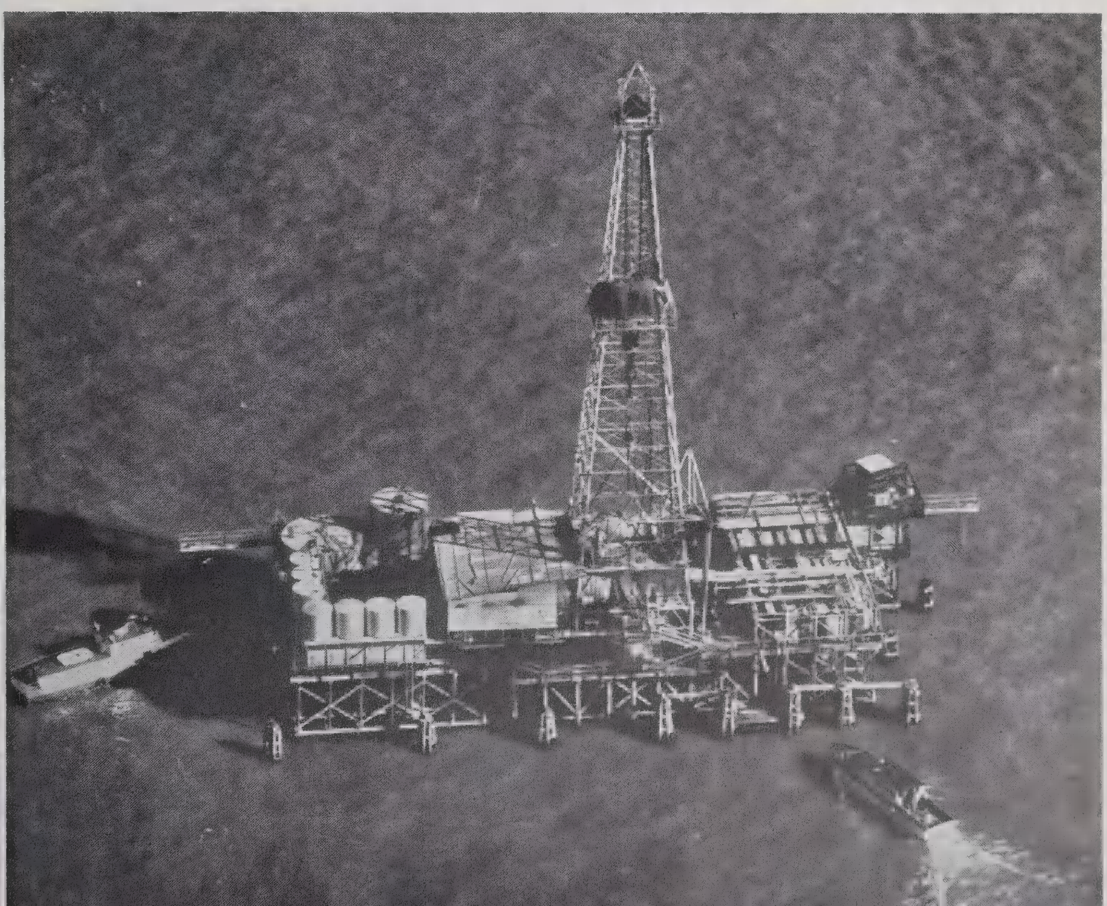
FINDING AND EXTRACTING OIL



TO-DAY the geologist, by his study of rocks and their arrangement, can tell in what regions oil is likely to be found. He can tell that in some areas there must be, far below the earth's surface, rocks capable of holding the oil, and that these must be covered by other rocks through which the oil cannot pass. With modern instruments he can often tell whether any oil is present at a particular place and how deeply it is buried. But only by putting down a borehole can he be sure. If the borehole reaches the oil-bearing rocks, the oil will make its way through it to the surface.

Many oil wells are over 10,000 feet, and some over 20,000 feet deep. A heavy steel bit is driven down through the rocks

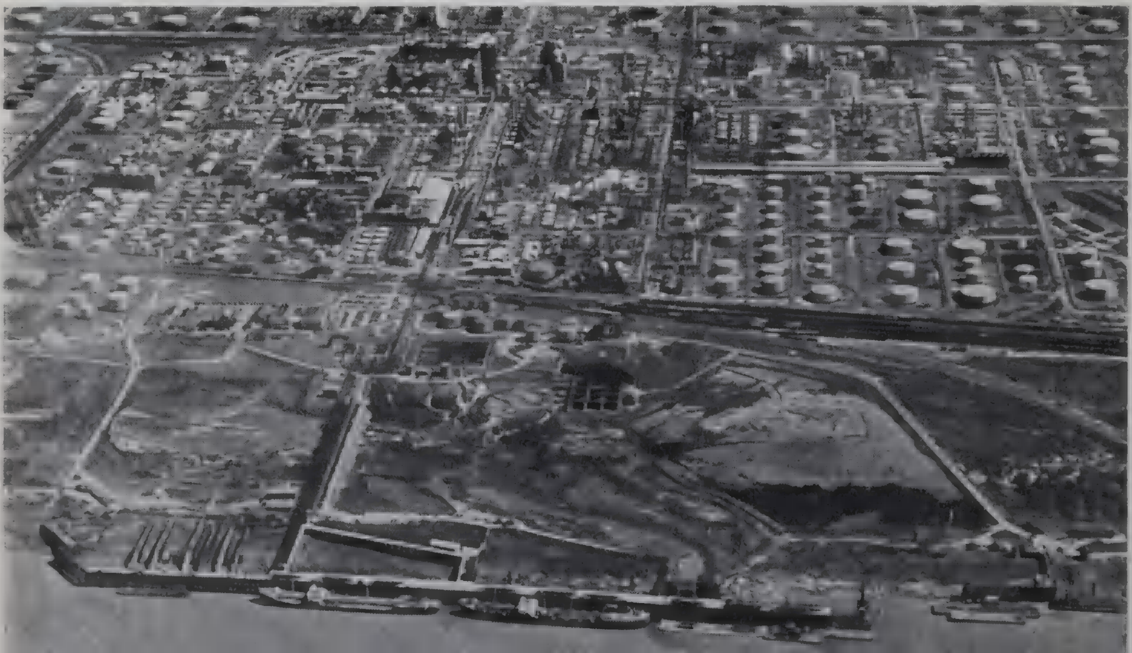
30. OIL FROM BENEATH THE SEA. A borehole is here being sunk into the rocks beneath the shallow sea off the shore of Louisiana.



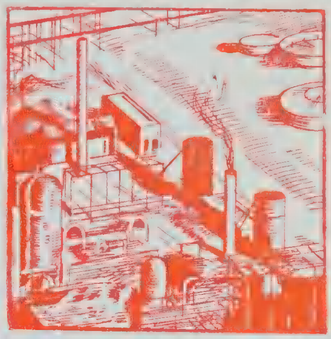
just as a carpenter drills holes in a thick piece of timber. The bit is turned by a small engine, and as it penetrates the rock, lengths of steel tubing are screwed on to lengthen its shaft. When oil is reached the drill is removed, and the borehole lined with steel tubing. Sometimes the oil gushes out in a great fountain, sometimes it has to be pumped.

A discovery of oil changes the whole district where it occurs. At once many skilled workers are needed. So a small town may spring up suddenly in a quiet farming district. But when the oil has been tapped and the pipes laid to carry it to the refinery, most of these people go away again. This happened in the Texas part of the Cotton Belt. In one district over 26,000 wells were sunk in ten years in an area about 40 miles long and 9 miles wide. Kilgore, which had been a little market town for the cotton farmers, became a busy centre with large shops and crowded streets. Then in a year or two most of the workers had gone and Kilgore was a quiet place again, although the oil is still flowing. Just a few men can control the flow of oil from the wells to the distant refinery. Around the Gulf of Mexico you will see oil derricks rising in the midst of the marshes, and wells are being sunk even out in the shallow seas. Like the sugar and the bananas, most of the oil is used far away from where it is found.

31. OIL REFINERY, BATON ROUGE (Louisiana). The largest refinery in the U.S.A. The storage tank "farm" spreads far around it and tankers and oil barges load at the wharf. How is the crude oil brought from the oilfield to the refinery?



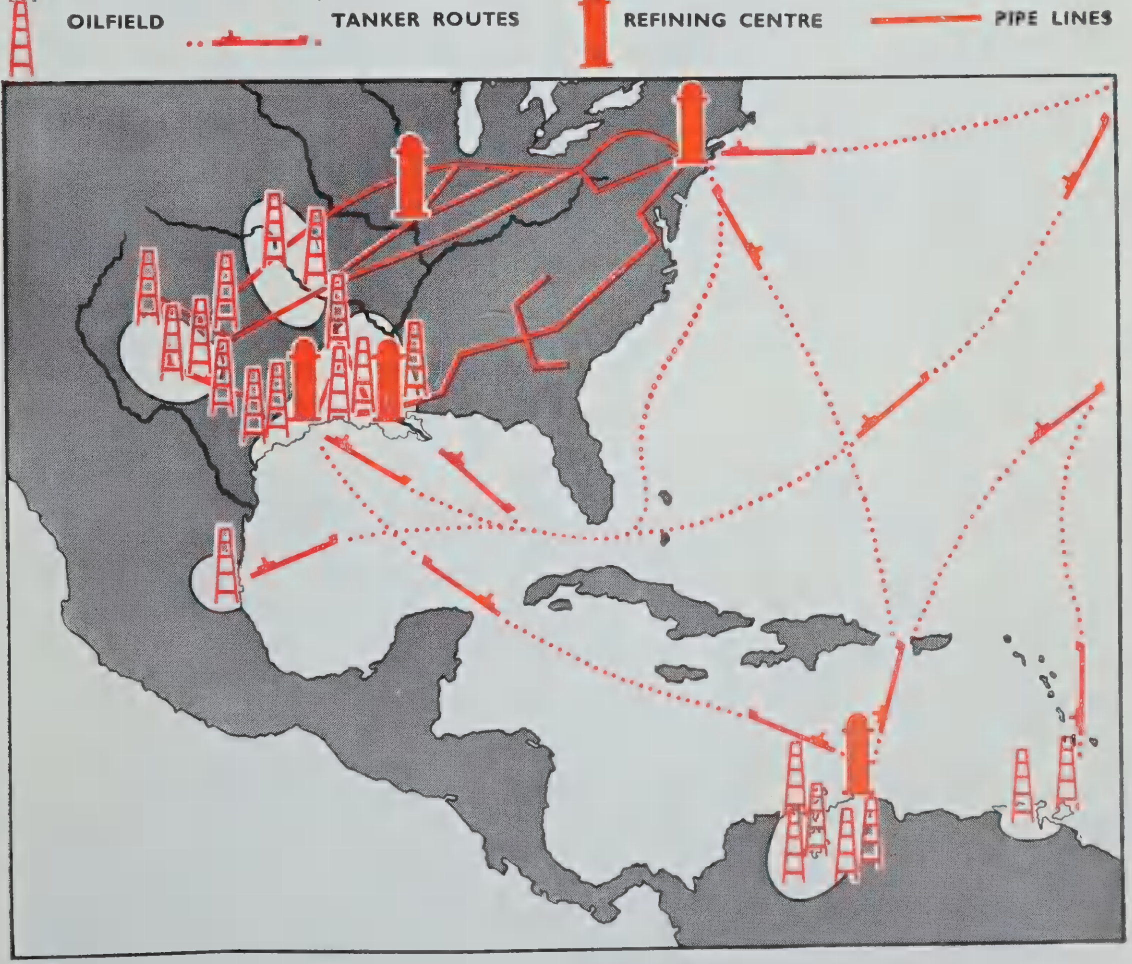
OIL WELL TO USER



TWO main products are obtained from an oil well—natural gas and crude oil. The gas can be stored and distributed to houses and factories, where it is just as useful as coal gas. Natural gas is taken in pipes all the way from Texas to Chicago and the Atlantic Coast. The United States is the only country in the world which has such great resources of natural gas at its disposal.

Crude oil is also taken in pipe-lines first of all to refineries. From here all the products must be distributed. Their transport

32. OIL DISTRIBUTION. Crude oil and refined products are distributed inland by pipe line and overseas by tanker.

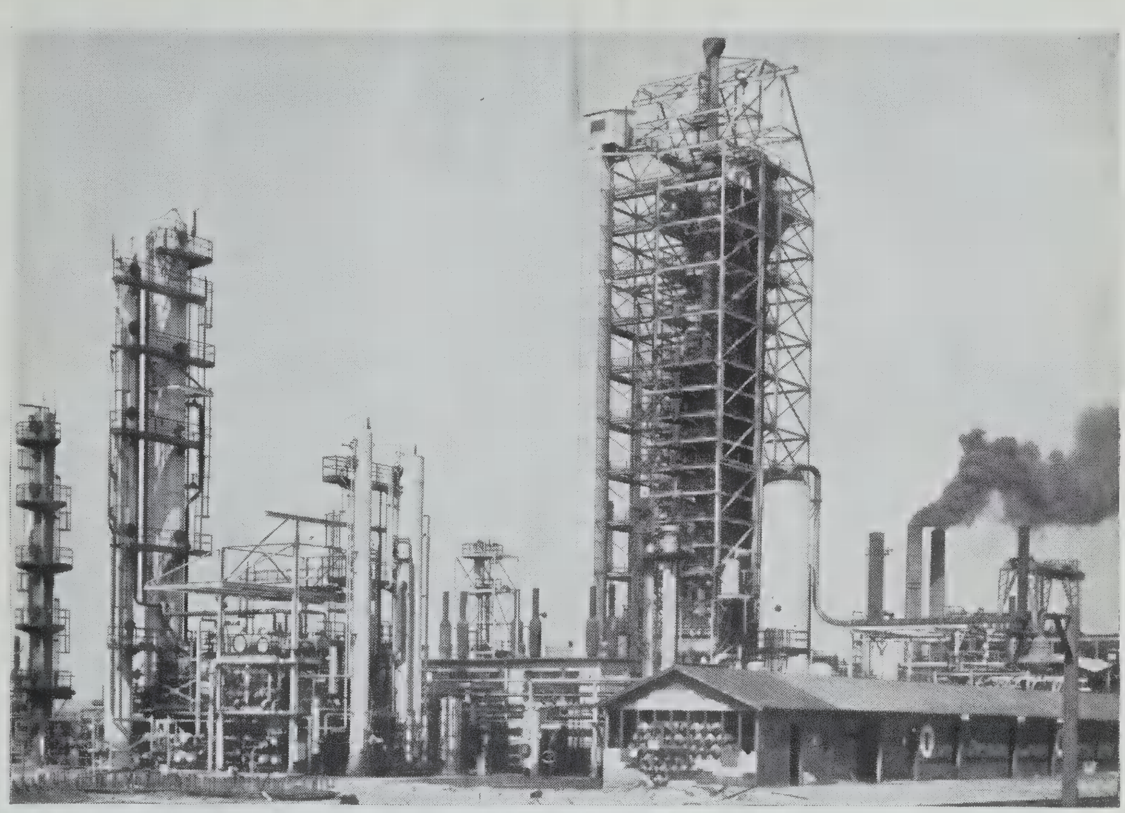


to every part of the world means a huge world-wide organization of storage tanks, ships, ports, lorries and pumps. Because of the great risk of fire or explosion, refineries and storage places are built well away from factories and houses. At the ports the oil is loaded or unloaded at separate wharves away from the docks where other goods are handled. Special ships carry cargoes of oil across the oceans. These ships are well named "tankers", for they are little more than steel tanks with engines to propel them and pump the oil and with quarters for the crew. Tankers are so carefully constructed that even such a dangerous cargo as aviation spirit can be carried in safety half across the world. From the ports special tank cars carry oil products by rail or road.

The United States produces more oil than any other country and it also uses more. The richest American oilfields are in Texas and Louisiana. The crude oil is pumped from these fields through pipe-lines to as far away as New York and Chicago. Great quantities are also carried north by tanker from storage places and refineries near the shores of the Gulf of Mexico.

Venezuela on the southern shores of the Caribbean Sea is second to the United States as an oil-producing country. Little oil is used or refined there, and so Venezuela exports large quantities of crude oil, mostly to Europe. Some Venezuelan oil is

33. A MODERN TANKER. Built to bring oil from Trinidad to Britain it is also fitted to carry a few passengers.



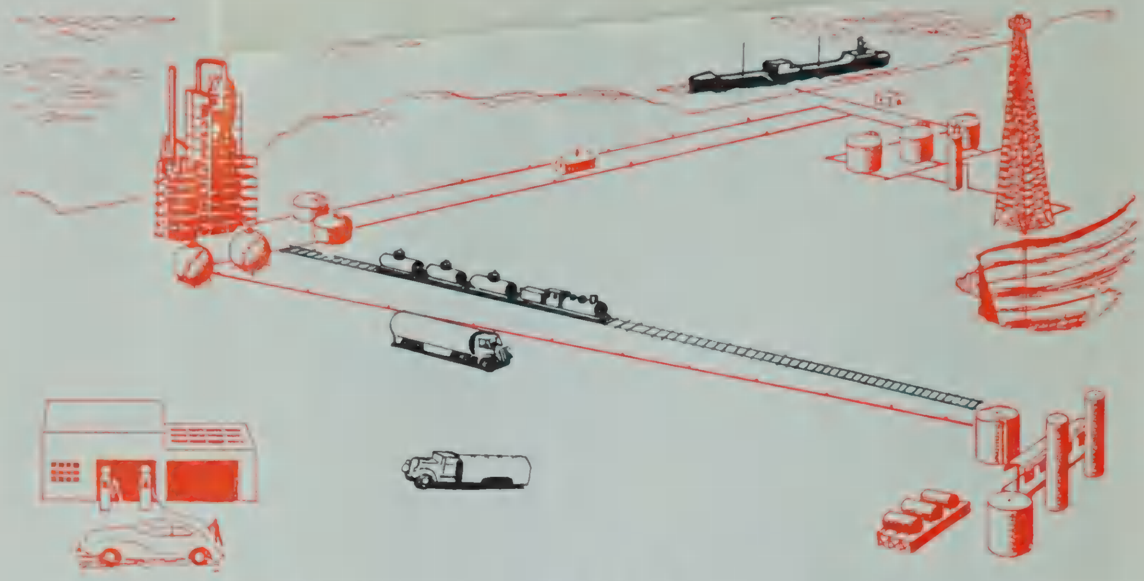
34. CRACKING PLANT IN A NEW JERSEY REFINERY. Crude heavy oil brought by sea from the Gulf oil-fields is split up (*i.e.*, cracked) to form a variety of light oils in greater quantity than could be got by simple distilling.

refined on the Dutch West Indian island of Aruba and some in Trinidad, where there are oil-fields as well.

Mexico was one of the first oil-producing countries. But the wells in many districts have been pumped dry, and Mexico is no longer an important oil-exporting country.

In the lands of the Spanish Main there was some treasure under the earth, a little gold, much oil. This will soon have been used up. But most of the peoples of these lands will continue to make a living from the products of the soil they tend—if they put back into it as much as they take from it—and from the clothing and goods manufactured in the factory towns growing up in the plantation countries.

Are most men in the oil industry employed in mining or refining or distributing ?

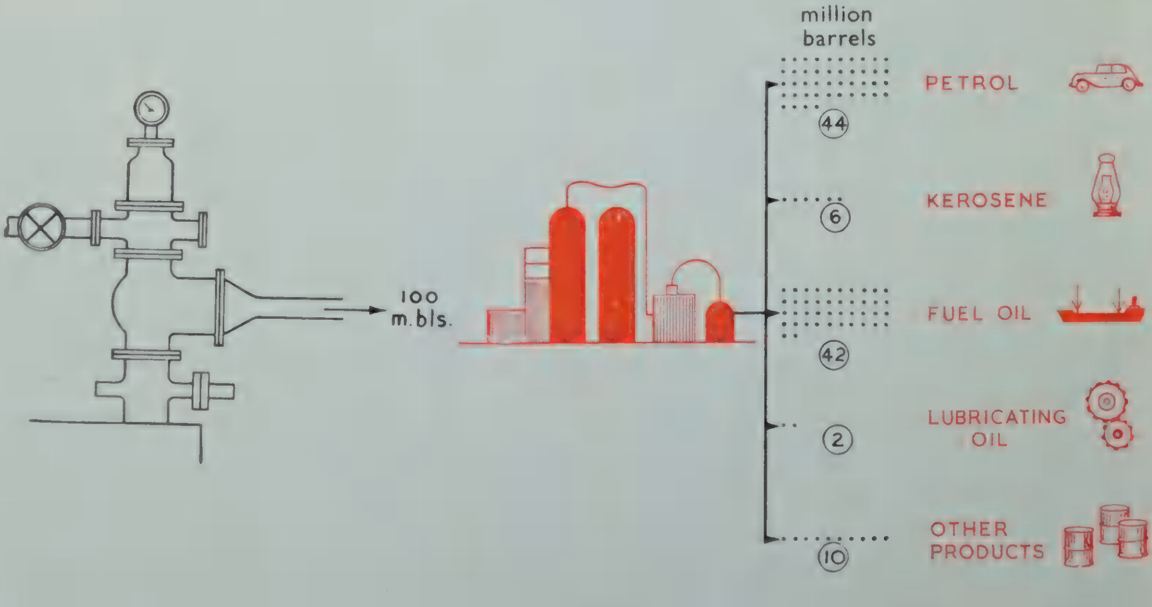


35. FROM OIL WELL TO FILLING STATION.

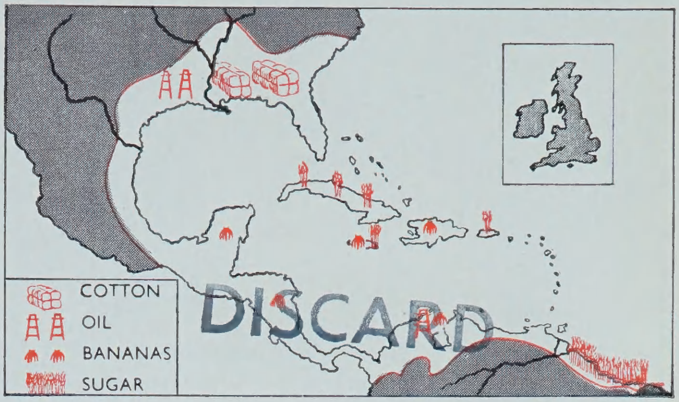
Crude oil from the well is pumped by pipe line either to a local refinery or to a tanker for carriage overseas to a distant refinery. In the refinery it is separated into "fractions" which evaporate at different temperatures. A great range of products, from the gas sold in cylinders and used for cooking in rural districts to wax for candles or polishes and hard coke for the aluminium works, is thus obtained. To increase the petrol fraction some of the heavy oils are "cracked" *i.e.*, split up chemically.

From the refinery the various products are sent by pipe line, tanker, and rail or road tank wagons to distributing depots near large cities.

36. WHAT HAPPENS IN THE REFINERY.



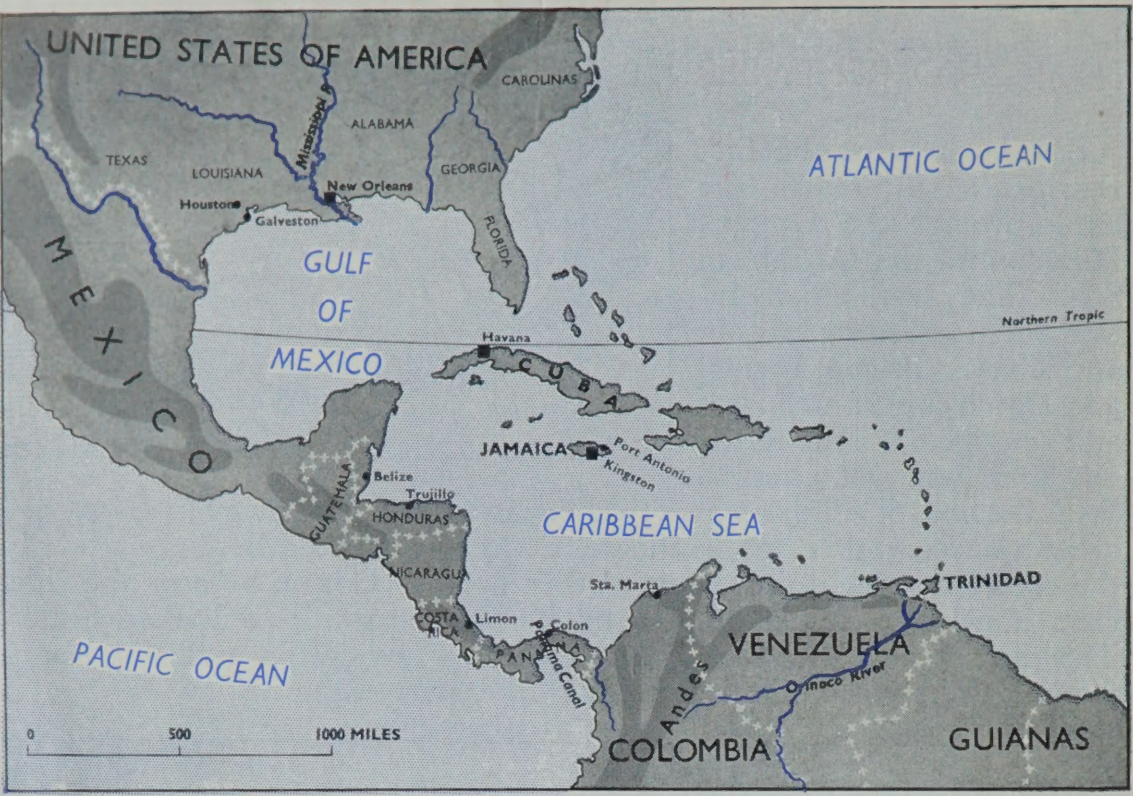
THINGS TO REMEMBER

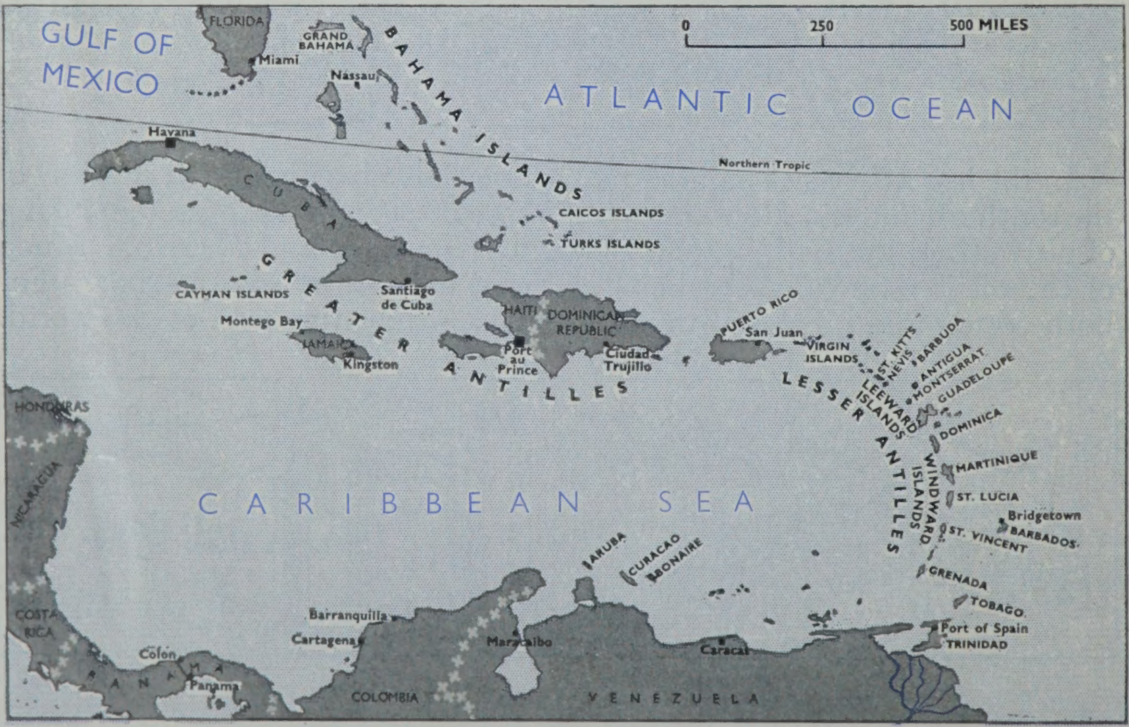


DISCARD

Spaniards were the first Europeans to reach the lands around the Gulf of Mexico and the Caribbean Sea. They were chiefly interested in searching for gold and silver. British, French and Dutch came much later and sought to use the fertile soil and hot wet climate. With the help of African slaves they began to grow sugar cane. Soon they grew tobacco and cotton in the same way. These did better however in the cooler and less rainy lands further north. Cotton became the chief crop in what is called the Cotton Belt of the southern United States. This district now produces half the world's raw cotton and also manufactures more cotton cloth than any other part of the world.

In the last fifty years banana plantations have been made near many of the southern and island shores. Still more important has been the sinking of oil wells in the Gulf States of U.S.A., Venezuela and Mexico. Much of the oil is refined before being shipped to more northern lands. For both cotton and oil this is much the most productive part of the world.





MADE AND PRINTED IN GREAT BRITAIN BY WILLIAM CLOWES AND SONS, LIMITED, LONDON AND BECCLES

C,

LONGMANS, GREEN AND CO LTD
6 & 7 CLIFFORD STREET LONDON W 1
LONGMANS, GREEN AND CO INC
55 FIFTH AVENUE NEW YORK 3
LONGMANS, GREEN AND CO
20 CRANFIELD ROAD TORONTO 16

LONGMANS, GREEN AND CO LTD
605-611 LONSDALE STREET MELBOURNE C 1
LONGMANS, GREEN AND CO LTD
THIBAULT HOUSE THIBAULT SQ. CAPE TOWN
ORIENT LONGMANS PRIVATE LTD
CALCUTTA BOMBAY MADRAS

First published 1955
Third Impression 1960

LONGMANS COLOUR GEOGRAPHIES

The Units are arranged in four groups

The twenty titles are:

1. Coasts of Britain
2. Farms of Britain
3. Towns of Britain
4. Industry in Britain
5. London
6. Forests and Savana: West Africa
7. Mining in Southern Africa
8. Ricefields in India
9. Great Plain of China
10. Island Harvests: The Far East

---

11. Grasslands of the Southern Continents
12. Atlantic to the Great Lakes
13. The Prairies
14. North American Cities
15. West Indies and Gulf Coasts
16. Lands in the Desert: The Middle East
17. Mediterranean Lands
18. Contrasts in Russia
19. Rivers of Europe
20. Industrial Neighbours

We are indebted to J. M. Kupfer for assembling the colour photographs for this series and to the following for their co-operation in respect of Unit 15: Earl Leaf, Rapho Guillaumette, for Fig. 6; United Fruit Co. for Fig. 7; Herbert C. Lanks, Black Star, for Fig. 17; Hamilton Wright Organisation for Fig. 18; J. J. Steinmetz from F.P.G. for Fig. 28; Rosskam, Standard Oil Co. (N.J.), for Fig. 29.

For permission to reproduce other photographs we thank the following: Paul Popper for Fig. 5; United Fruit Co. for Figs. 8, 10, 11 and 14; Exclusive News Agency Ltd. for Fig. 13; Ewing Galloway for Fig. 16; Bureau of Reclamation, U.S., for Figs. 19, 21 and 24; Socony-Vacuum Oil Co. Inc. for Figs. 30 and 34; Standard Oil Co. (N.J.) for Fig. 31; Regent Oil Co. Ltd. and W. Ralston Ltd., Glasgow, for Fig. 33.

University of Alberta Library
0 1620 0453 3517
A12544

UNIT 13
THE PRAIRIES
UNIT 12
ATLANTIC TO THE GREAT LAKES
UNIT 14
NORTH AMERICAN CITIES
UNIT 15
WEST INDIES AND GULF COASTS
UNIT 11
GRASSLANDS OF THE SOUTHERN CONTINENTS

LONGMANS COLOUR GEOGRAPHIES

FOR FULL LIST OF TITLES
SEE INSIDE BACK COVER